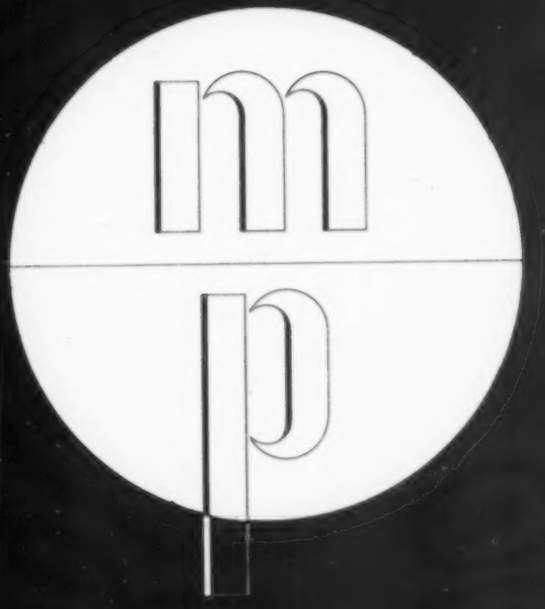
MODERN PLASTICS



APRIL 1935

The use of

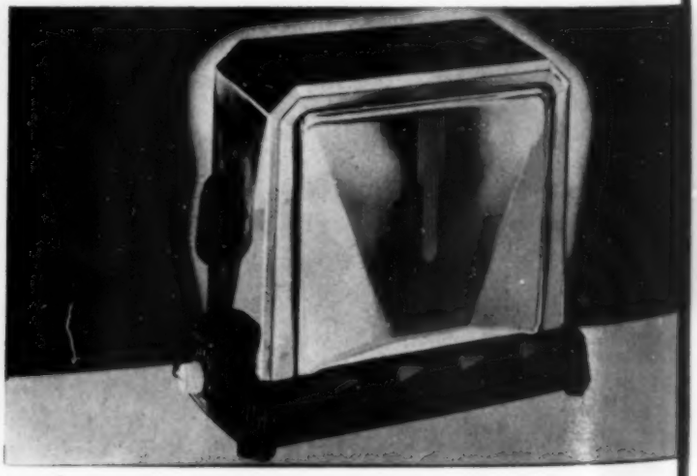
Versatile, Dependable Durez

makes

A MORE ATTRACTIVE RADIO . . . Chicago Molded Products molded this Kadette radio case of rich, mahogany Durez. The smooth, lustrous finish is in keeping with the modern design of the radio, and will not grow dull after hard use. The entire case leaves the mold complete and ready for assembly . . . no costly finishing or refitting operations are necessary. Because Durez is dielectric, no special insulation between radio and case is necessary.

A LIGHTER, LOWER-COST FIGURING MACHINE . . . The new Ba
Figuring Machine, made by Lanston Monotype, is housed in a molded D
case. Durez' structural strength withstands the hard use, yet it is so lig
weight that the machine can be easily carried in a handbag. The perm
Durez finish is produced right in the molding process, and will never chip
or scratch. Producing the entire case in one molding operation cuts produ
costs. Case molded by Kuhn and Jacobs Molding and Tool Co.

A FASTER FOUNTAIN MIXER . . . Designed to mix drinks in ¼ the time required by machines now in use, the Andis Speedwhip is the result of sound engineering and careful design on the part of American Record Corporation. The entire chassis is molded of Durez, complete with metal inserts, oil-less bearings and bushings. The structural strength and enduring finish of the Durez parts assures long service life for the machine



A BETTER TOASTER . . . Manufactured by Proctor and Schwartz,
toaster is a fine example of modern design. Tech-Art Plastics molded the ba
heat-resistant Durez because temperatures of 450° will not affect its attra
glossy finish. The entire base, complete with inserts, dial and handles, is m
in a single operation. The applications of Durez to modern electrical appli
are unlimited.

For more complete information, write General Plastics, Inc., 354 Walck Road, North Tonawanda, N. Y.

YOU CAN DO IT BETTER WITH **DUREZ** THE MODERN MOLDING COMPOU

APRIL 1935

VOLUME 12 NUMBER 8

MODERN PLASTICS

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Published the 5th of each month by Breskin & Charlton Publishing Corporation. Publication office at 20th & Northampton Sts., Easton, Pa. Advertising, editorial and general offices at 425 Fourth Ave., New York, N. Y. Telephone Ashland 4-0655. Western office, 221 N. La Salle St., Room 620, Chicago, Ill. Telephone Randolph 6336. Entered as second class matter September 21, 1934, at the Post Office at Easton, Pa., under the Act of March 3, 1879. Subscription $5.00 per year. Foreign and Canadian postage $1.00 a year extra. Price this issue, 50c per copy.

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(A Superior Laminated Phenolic Product)

From tiny washers to gigantic gears **INSUROK** molded and laminated materials find thousands upon thousands of different uses in hundreds of industries.

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Why INSUROK replaces other materials

1. *Tougher!*
2. *More resilient!*
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4. *Easily fabricated!*
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6. *High dielectric!*
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8. *Non-corrosive!*
9. *Mechanical shock absorber!*
10. *Fabricated to your order!*

The Richardson organization, the largest in the United States devoted exclusively to the plastic arts, offers you (as custom molders of all forms of synthetic plastics) the services and cooperation of its Research Laboratories, Design and Engineering Departments.

The RICHARDSON COMPANY

Founded 1858

Melrose Park, Ill. New Brunswick, N. J.

APRIL 1935

VOL. 12 No. 8

MODERN PLASTICS

BRESKIN AND CHARLTON PUBLISHING CORP.

PLASTICS IN SPORT

FISHING
GOLF
TENNIS
HUNTING

MOLDED plastics dominate the electrical field because of their insulating and structural qualities. Cast phenolics have conquered the costume jewelry market because of the infinite variety of their shapes, colors and effects. Conquests such as these—while by no means easy—are accomplished in a comparatively short space of time because one or two specific qualities, offered by plastics, far excel anything offered by any previously used material.

There are other fields, however, in which progress is much slower. Of these, the outdoor sporting goods industry is typical... so typical that we have chosen it here as testing ground for a search for the reasons that operate to retard the adoption of plastics.

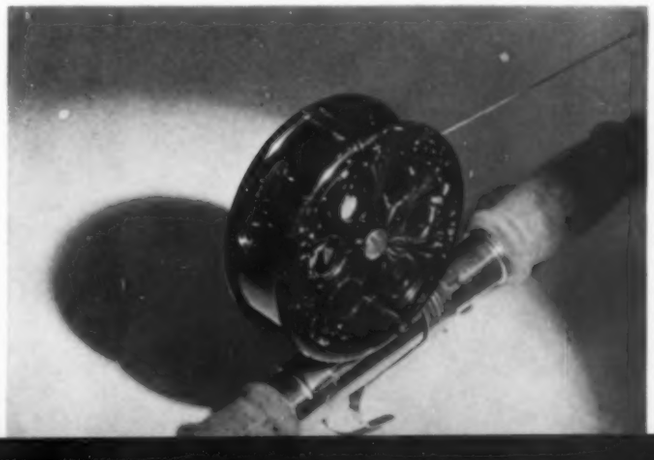
Let us begin by posing our questions.

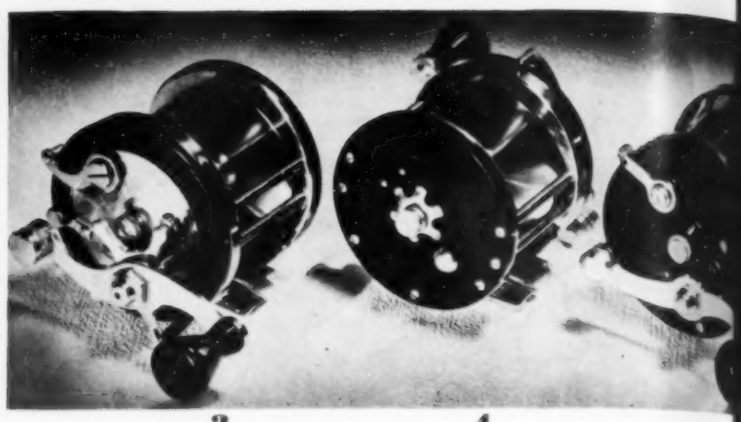
One: To what extent is this industry adopting plastics of various kinds?

Two: Have plastic manufacturers and suppliers done sufficient educational work to insure a maximum rate of progress in the adaptation of plastics wherever possible in the field?

Three: Has the sporting goods industry—or the plastic supplier—done any or enough work in the direction of acquainting the consumer with the advantages achieved when plastics are used?

It is obviously impossible, within the confines of a single article, to consider all the instances in which sporting equipment has been made, in whole or in part, of plastic materials. It is possible, however, to select representative examples and to judge the whole by





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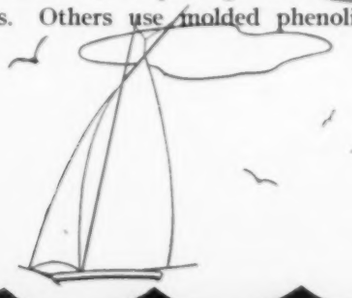
this representative part. In so doing, one curious fact becomes immediately apparent—the manufacturers of fishing equipment are the outstanding users of plastics in the entire field. Literally dozens of different models of fishing reels are available, either entirely molded of plastics or with molded frame plates. Literally hundreds of pyroxylin and acetate fishing lure models are on the market. Several manufacturers of fishing lines use molded-phenolic or pyroxylin spools. Several others make such items as fly boxes with acetate linings and dividers, or package flies in transparent plastic vials. Others use molded phenolic or acetate-sheet boxes both as original package and re-use fly containers. Hardly a single manufacturer in the field exists that does not fabricate at least one item in which plastics play an important part.

Contrast this with the rest of the industry. Some steel shafted golf clubs are covered with shrunk-on acetate tubing. Some other golf clubs use cast phenolic inserts in their driving heads. Some bowling pins, Indian clubs and baseball bats are made of cast phenolics or resin-impregnated woods. A few types of protective groin, hip and knee guards are made of pyroxylin or acetate sheet, molded to shape. Shoe cleats



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have recently been molded of phenolics. Hot meal containers, too, have been successfully introduced with molded parts. Add a few gun parts, molded golf tees, pyroxylin scoring mechanisms and various types of goggles and you have encompassed practically all of the non-piscatorial applications of plastics in the sporting goods field.

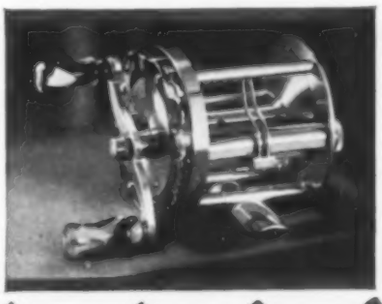
It may be argued that plastics have peculiar qualities that fit them for use in the construction of fishing equipment. It is true that they are well equipped to resist repeated exposure to sun and water...that they far excel any other material for certain types of lures. But these very qualities of strength, resistance to wear, resiliency, color, transparency, translucency, etc., likewise fit them for adaptation to other outdoor sporting accessories.

The sad truth is that the industry has done too little educational work among sporting goods manufacturers. This fact became clearly apparent when answers to a series of inquiry letters, addressed by MODERN PLASTICS to various sporting goods manufacturers, were analyzed. While every factor in the fishing equipment end of the industry (whether using plastics or not) was acquainted with the primary facts about plastics, few among the non-users in other branches had even a knowledge of the existence of the entire plastic group of materials. Questions were asked and statements made which demonstrated that several confused plastics with plasters, while others plainly queried, "What are you talking about?"

This condition is likewise true among those who sell and those who buy sporting goods. The writer's experience in the largest and highest priced sports store in New York will serve to illustrate the point. Conferring with the advertising manager of the store, he brought forth in succession the words "plastics," "molded-parts," "Bakelite." The first two produced only a blank expression on the listening gentleman's brow. The third, much publicised word, brought a glimmer of recognition. "Oh, yes," he answered, "I seem to recollect that we once had a Bakelite fishing reel. Why don't you see Mr. X. in our fishing supply department?"

Mr. X. was a trifle better acquainted with the materials. He pointed out some fifty odd reels as being of Bakelite...a word which sufficed, for him, as a generic term. But he couldn't tell what advantages the material afforded, being content to opine that "Some like one kind and some like another, so we carry all." Mr. X.'s assistant in the lure division was likewise well informed. With better than fifty per cent of his lures made of pyroxylin or acetate, he was quite unaware of the fact, to say nothing of being aware of the advantages or disadvantages afforded by the material. He too thought that some liked one thing and some another. He too couldn't tell why.

A recital such as the above may sound humorous, but



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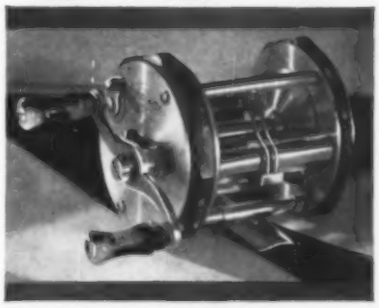

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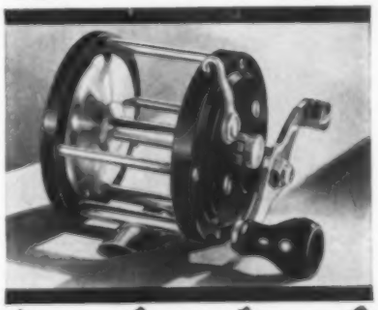

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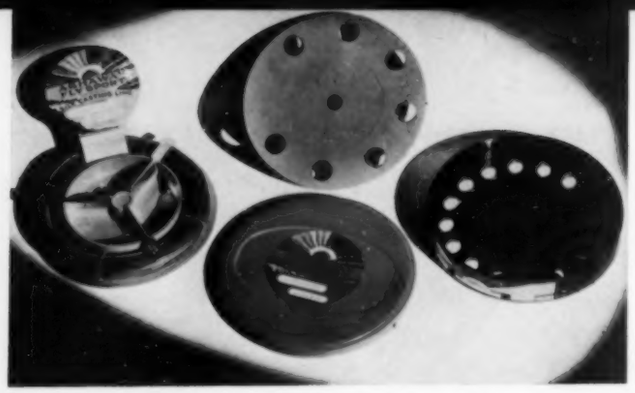

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it is indicative of an unsound condition within the sporting goods industry that is acting as a brake to progress. Users of plastic materials and moldings, as well as firms who supply them, have both done all too little to acquaint sellers and consumers with the nature, the advantages or even the names of the materials used. Added to the retarding influence of lack of in-

OUTSTANDING PLASTIC

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1. Brownie Fly Reel molded by the Diemolding Corporation. Available in both Bakelite and Durez. The reel is in two parts, the inner spool being removable for cleaning and drying.

2. Bill Dewitt Pyra-Shell Baits, formed of pyroxylin by the Shoe Form Company for its subsidiary, the Bill DeWitt Bait Division. Important considerations favoring the use of pyroxylin include toughness, resiliency and permanent finish. Unlike metal baits, these spring back to shape when dented. Unlike wood or metal baits, the finish of these does not crack, chip or come off after a period of service.

3–4. Front and back views of Ocean City salt water reel, made by the Ocean City Manufacturing Company and utilizing molded phenolic ends made by the Specialty Insulation Company. Note that the metal core on the winder-side of the reel is treated as an insert in the molding. Handles are of Catalin.

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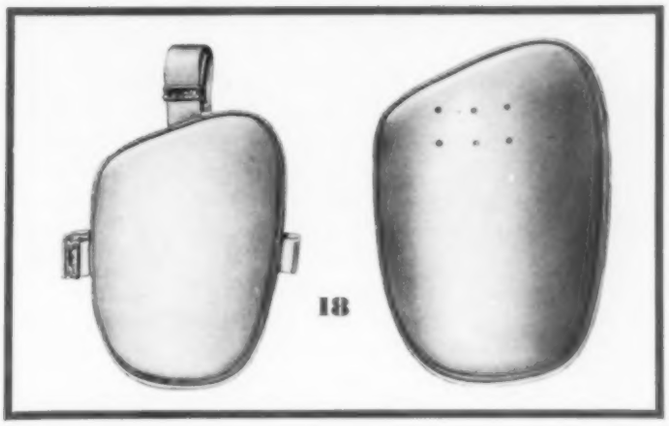
5. Another reel of the molded-end type, this Palmetto Salt Water Reel is manufactured by Abbey and Imbrie. Note that the molding rises to enclose the shaft of the handle.



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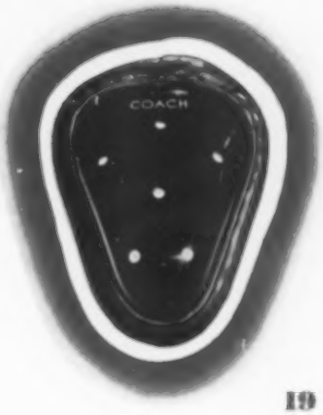

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formation comes the definitely harmful influence of the clerk who supplies misinformation. Both together will certainly never produce that excess of plastic sales which will induce a wider use of these materials within the large sporting equipment industry.

What specific measures are to be taken remains a matter for the individual manufacturer and supplier to decide. That some measures, must, sooner or later, be taken, either individually or by the sporting goods and plastic industries as a group, is obvious. For, if fishing equipment, in spite of ignorance and misinformation could produce so many points of plastic usage, the industry as a whole, properly exploited, offers a challenge to molders and fabricators which cannot long be ignored.

APPLICATIONS IN THE SPORTING GOODS FIELD

6. The National Sportsman reel of the Horricks-Ibbotsen Company is of the two piece type with a small molded handle held in place by a screw.

7. The Bullseye Takapart reel, marketed by the A. F. Meisselbach Division of the General Industries Company. The molded parts are made by the parent company.

8. The Vernley reel, produced by Horricks-Ibbotsen, again demonstrates the usefulness of all-molded construction, even when the reel is an extremely inexpensive one.

9. The St. Paul Bait Casting Reel, marketed by the Ocean City Manufacturing Company. This inexpensive type has a walnut grained Bakelite side plate with Catalin knobs.

10. Another reel of the molded spool-molded case type, sponsored by the Weber Lifelike Fly Company and molded by the Chicago Molded Products Company.

11–12–13. Three reels produced by the Shakespeare Company utilizing moldings made by Reynolds Molded Plastics.

14. The Ashaway Line and Twine Mfg. Co. packages its lines in boxes molded by the Diemolding Corporation and made of Bakelite. The box consists of a ventilated bottom, a revolving spool and a cover which locks into place. On the spool are placed metal clips which assist in holding the line in place. The pockets in the center of the spool are used by fishermen as storage space for flies. The spool is so molded that round segments can be punched out by hand to permit of better ventilation.

15. The S. A. Jones Line Company uses pearl effect pyroxylin spools in marketing its Black Pearl line.

16. The Weber Lifelike Fly Company sponsors this aluminum fly box with acetate-sheet lining and dividers as well as the Lusteroid Vial for holding flies. The Shakespeare Company uses this heavy-acetate-sheet box...transparent above and with black bottom... made by the Celluloid Company.

17. Shapleigh's Ultra Casting lines reach the public in a black Durez box molded by Norton Laboratories, Inc., and closed with a red molded top.

18. A. G. Spaulding Company uses Bakelite in fabricating thigh guards for use by football players.

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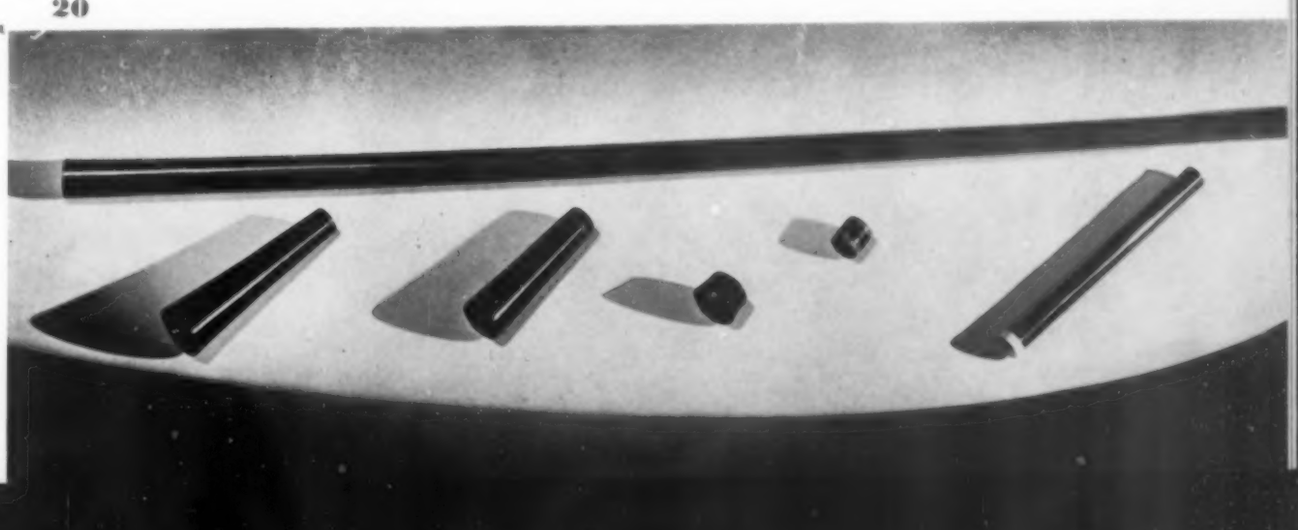

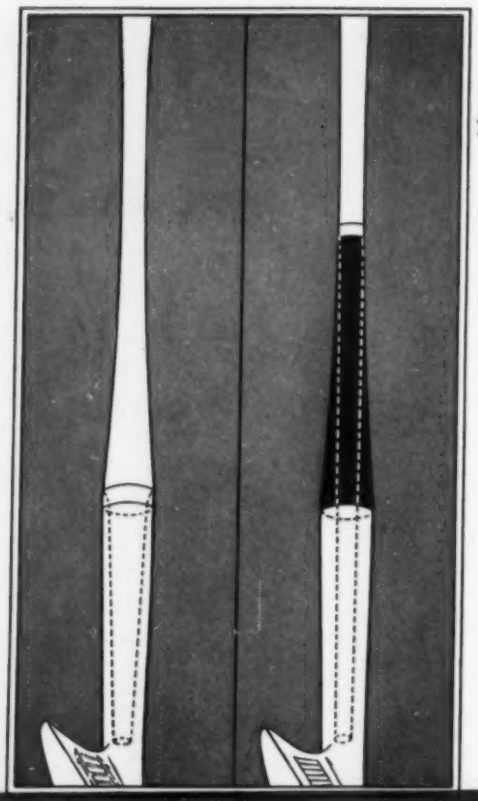

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19. As a groin protector for baseball players and other athletes, Lumarith has largely replaced the previously used aluminum. The plastic material springs back into shape when hit and therefore remains undented.

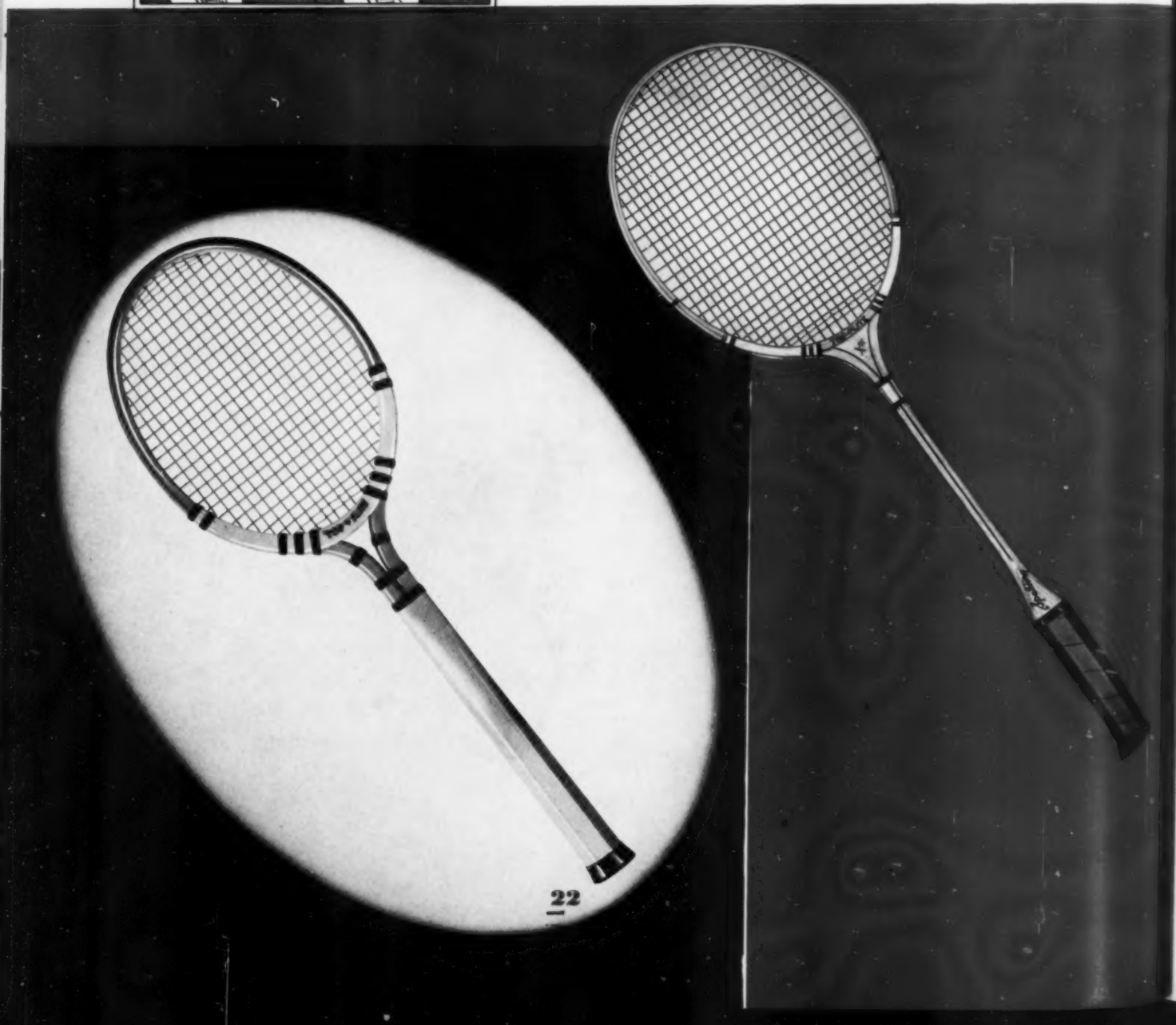
20. Celluloid sheaths and fittings have been extensively used by Kroydon Mfg. Co. for its golf clubs.

21. A special process shrinks the celluloid sheath to perfect conformity with the "triple-tapered" shape of the unique Kroydon driver. The sheath prevents rust while permitting the metal shaft to swing with full "whip" and flexibility.

22. Spaulding Top-Flite Tennis and Badminton Rackets now have shoulders and throats of white Fibreloid laminations, thus gaining extra strength and resiliency.

23. The Dev Hot Meal Container utilizes molded parts, fabricated by the Chicago Molded Products Company, in combination with metals. The molding aids in heat insulation.

24. Catalin finds a number of applications in addition to those mentioned before in relation to fishing reel handles. Here we see inserts in a golf driver, handles for a skipping rope, an Indian club, and two-



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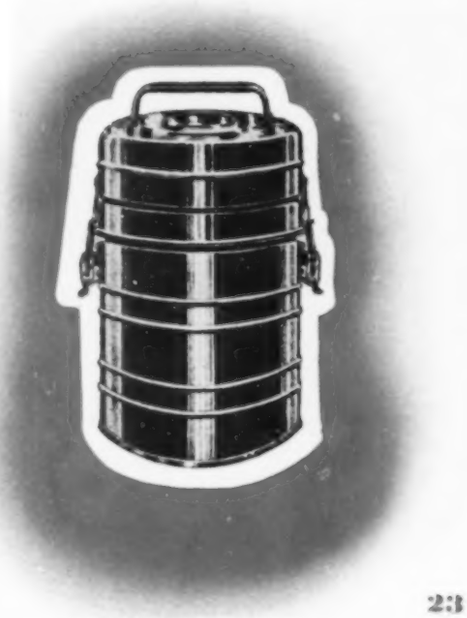

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24

piece handle for a hunting knife. Photo courtesy American Catalin Corp.

25. Winchester Rifles now have a black molded section at the front of the stock, molded by the Watertown Manufacturing Company. Photo courtesy Winchester Repeating Arms Co.

26. Recto Molded Products makes these black-phenolic molded cleats for A. G. Spaulding's football shoes. Providing long wear, these may yet be easily replaced when worn down.

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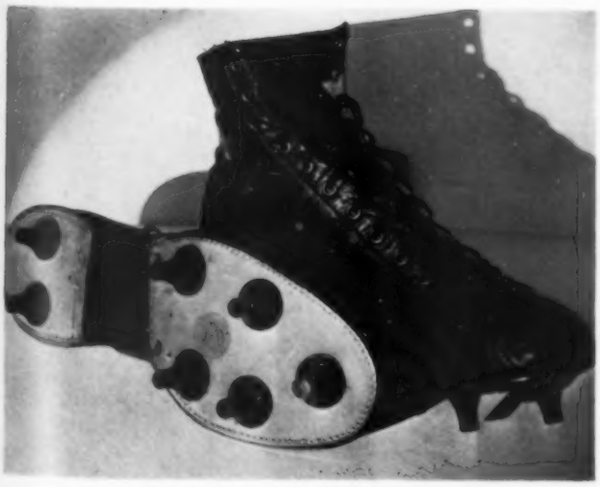

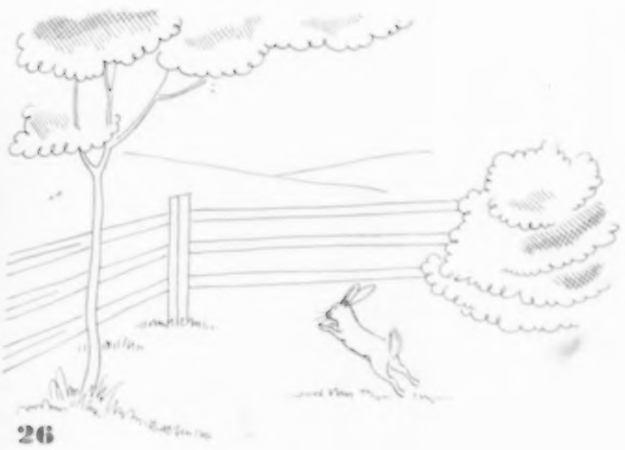

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CHANGING FASHION DEMANDS VERSATILE MATERIAL

by E. L. Fredericks

WHEN tweeds and other rough fabrics stepped into their present prominence and gave business women the jaunty, comfortable, well-dressed appearance they present today, the field of sports jewelry spread before them like a sunny hillside sloping from a Scottish moor. Sports jewelry of nearly every conceivable material sprouted, blossomed, and bore fruit. It found ready sale in a waiting market, and because it was popularly priced, it sold with surprising volume. Plastics, in considerable measure, contributed to this success. The material which has gained the greatest general acceptance and the one most likely to survive on its own merits is that hardy perennial, cast phenolic.

The versatile nature of cast phenolics, which permits their fabrication without the use of expensive molds, allows them to travel the ever changing path of fashion with but small loss, through such changes, to those who make and sell them. Their gay and permanent colorings are of sufficient attraction to assure feminine attention and their individual appeal becomes simply a matter of well-planned design.

Women, whose arms and fingers have been stained in warm weather by metal bracelets and rings, turn naturally and gladly to rings and bracelets which commit no such offense. They welcome the broad range of color from which they may select suitable adornment for many costumes and, because the price is kept within conservative limits, it is possible for the most modest budget to permit the possession of two or more complete sets of jewelry which may be worn separately or ensemble as occasions demand. Since plastics are never cold to the sense of touch, they have an additional

Here and on the opposite page may be seen both the finished items and the raw Marblette from which they are fabricated. Between the latter and the former stand a few moments of skilled work —a few years of expert training

advantage over metal when worn on bare arms and, because they are lighter in weight, they can be made in a wide range of items with impressive dimensions and never feel clumsy or awkward to wear.

As there are many types of women, so are there many kinds of sports jewelry. The popularity of plastic ornaments has made rapid strides in the chain stores where millions of pieces are sold yearly to that share of the populace who find satisfaction within its limitations. Then, too, there is the other extreme. Rare objects carved from Prystal and other foreign and domestic plastic materials with the painstaking care of the craftsman whose sole object is to produce a thing of rare beauty. These latter pieces give evidence of long hours consumed in their forming and finishing and are priced in an appropriate manner. Between these two markets is a broad path trod daily by the average woman of moderate means whose interest in sports jewelry at popular prices can be developed, and has been developed, by manufacturers with a flair for fashion and a practical vision of popular design.

Cast phenolics have made possible the fabrication of a complete and well rounded line of sports jewelry to appeal to this average woman of moderate means. She cannot help but thrill at the assortments offered and her imagination knows no bounds as she stands before a counter to make her choice. Rings of plain or intricate design in a wealth of patterns and sizes for every occasion may be had to match bracelets of huge or tiny proportions as her particular interpretation of fashion demands. Bar pins, earrings, clips and buttons and buckles of identical pattern and color await her selection. If she is one of those ultra moderns who insists the coral or carmine of her nails shall match the coral or carmine of her lips, then more than likely she will be delighted to learn that she can procure bracelets and rings to match them both. Color harmony is not the least, nor is it the greatest appeal from the feminine viewpoint. Appropriate design and suitable size are exceedingly important when choosing an ornament to emphasize the neckline of one's costume, and with many costumes, many ornaments will be chosen at these popular prices.

Mr. A. D. Seidman, president of the Ace Plastic Novelty Corporation which makes popular priced sports jewelry exclusively for the jobbing trade, has enjoyed particularly successful experience in this branch of the industry.

"Cast phenolics," says Mr. Seidman, "are the ideal materials for fabricating sport jewelry because of rich and lasting colorings and their extremely light weight. Sport jewelry, because of the very purpose for which it is worn, demands color and bulk without weight. It demands chic and smartness without flash. Rich opaques in the broadest range of delightful colors vie with an equally wide range of softest pastels and are splendidly balanced by lustrous blacks, whites, and clear phenolics to a completeness offered by no other material. Furthermore, they are odorless and nonporous so that they neither absorb perspiration, tarnish nor change color.

"Another advantage of fabricating sport jewelry from cast phenolics is the number of matching pieces that can be included in the line. We make sets of bracelets, earrings, clips, finger rings, buckles and pins in matching colors and designs, and if one cares to go that far, buttons and millinery ornaments may be secured in the same motif to complete an ensemble of extremely striking effect."

I asked Mr. Seidman how he could produce such good looking merchandise to sell (*Continued on page 66*)

A group of coupon clipping rooms, in the Philadelphia Savings Fund Society building, showing clean, sanitary doors of laminated black phenolics with raised numerals of heavy metal. Howe and Lescaze, architects

WILLIAM LESCAZE
DEFINES DESIGN

An Interview by E. F. Longee

William Lescaze . . . . Architect

Mr. Lescaze was born in Geneva, Switzerland, in 1896. He studied architecture at Zurich at the Ecole Polytechnique under Professor Karl Moser, one of the pioneer modern architects. In 1920, he came to this country, working first in Cleveland, then settling in New York in 1923 where he established his own firm at that time. In 1929 he became a citizen of this country. In the same year he formed a partnership with George Howe, a prominent Philadelphia architect.

Aside from the 33-story bank and office building for the Philadelphia Saving Fund Society, designed by Howe and Lescaze, some of their better known buildings, all in the modern style, are the Oak Lane County Day School in Philadelphia; the Hessian Hills School at Croton-on-Hudson; a country house and its interiors in Connecticut for Frederick V. Field; a studio for Roy Spreter, the artist, near Philadelphia; a house for the headmaster of a progressive school in Devon, England, and dormitories and a gymnasium for the same school and Mr. Lescaze's own city house in New York.

Some of Lescaze's new work under construction is: a city residence and its furnishings at 32 East 74th Street; remodeling of another house at 17 East 73rd Street and its furnishings; a housing development in England and two large buildings for a summer camp.

Lescaze is a member of the Architectural Board of the New York City Housing Authority; a member of the American Institute of Architects and serves on its foreign relations committee. He is a registered architect in both New York and Philadelphia, and is a member of the International Congress of Modern Architects.

THOSE substantial citizens of Philadelphia who are privileged to clip coupons in the ultra-modern bank and office building of the Philadelphia Saving Fund Society may do so in smart individual coupon rooms equipped with every convenience for this important work. Their privacy is assured by softly closing, light-weight doors of black laminated plastic material. Clean, sanitary, and with a finish as lasting as the bank itself.

The Philadelphia Saving Fund Society lays claim to being the oldest savings bank in America and certainly no one will deny that its new home is one of the most modern. Its new building went up three years ago under the supervision of Howe & Lescaze, New York and Philadelphia architects, who drew its plans, and no end of favorable comment and picturization have made it known throughout the land.

Plastics were not used generously throughout the bank due perhaps to the fact that at the time it was planned plastics, other than in laminated form, were little developed as architectural material. They appear, however, here and there, as on the dial of the huge modern clock whose hour marks are indicated not in conventional numerals, but in discs of brilliant red cast phenolics.

I asked Mr. Lescaze if in his opinion plastics had contributed greatly to architecture and to modern design.

"They have given us a new material of definite superiority in certain directions with definite limitations in other directions, if you get what I mean," he replied.

"Modern thought which is the real basis of modern design is a philosophy of life. It is the intention to create tangible plastic forms which are appropriate to our lives of today. For one reason or another flat roofs, tubular furniture, all things made from glass and chromium or other metals, and so forth, have been said to be modern but these things in themselves do not constitute necessarily good modern design. They are simply experimentations in certain directions with certain materials. Good modern design will be eventually the successful solv-

★

Looking down from the balcony at the main banking room of the Philadelphia Savings Fund Society building, designed by Howe and Lescaze, one sees counters which are more beautiful in their functional simplicity than the paneling and grille work of a former day

ing of the definite American problem of today with materials of today.

"Many manufacturers have been slow in realizing this and some architects have been forced to become industrial designers as well.

Industrial designing is a very swell profession and absolutely essential to the American scene. It is an architect's job to create a building as a whole, to make it beautiful, livable and to embody every convenience of purpose for which the building is intended. This he cannot do unless every detail has been brought into play to place it in harmony with the ensemble.

"Four walls and a roof may form a building of sort, but what sort?

"Modern buildings must have modern fittings and equipment. There are gadgets galore; switch-plates, plumbing and lighting fixtures, heating and ventilating equipment, hardware and a hundred and one other things which generally speaking have not been redesigned to contemporary needs and demands. It is the business of the architect to either find or create them. If a building is to gain the distinction its investment deserves, many of these items must be especially designed to be appropriate and fitting, otherwise harmony and perfection are not achieved.

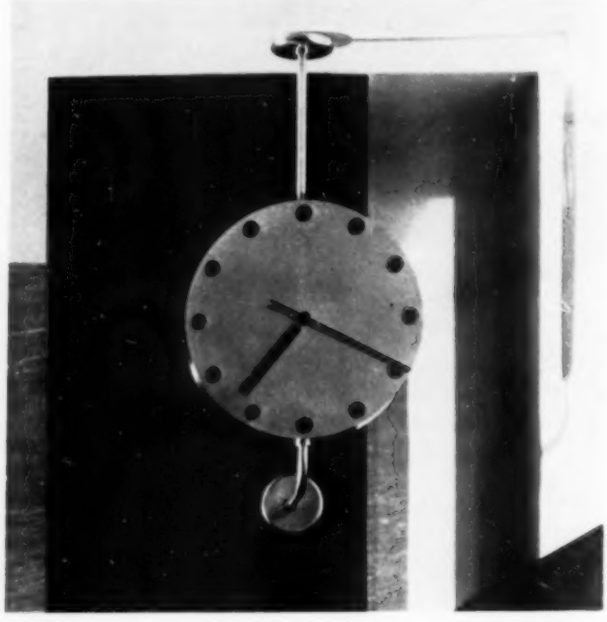
"In creating the building for the Philadelphia Saving Fund Society it became necessary to create most of the equipment as well. Ash trays, lamps, clocks, filing cabinets, counters, furniture, even push-buttons had to be designed to meet meticulous requirements simply because those things available in the market were either unsuited to modern use or so ugly that they would have been discordant notes.

"Quite a few manufacturers still hold to the idea that appearance alone is the objective of good modern design, which theory is not based on fact. In my opinion, it is worse than bad.

"Again—our modern conception of architecture is that it is beautiful only if it first solves the technical problems—the guts of the thing. If from that, and from available materials, you arrive at a form which simplifies production, packaging and distributing problems, then you are pretty close to a successful and most likely a beautiful form. Styling is not simply omitting or adding a few lines here or there, but is a serious study of the whole and particular problem at hand. First, there must be a careful and thorough analysis. Then, design to meet the requirements economically."

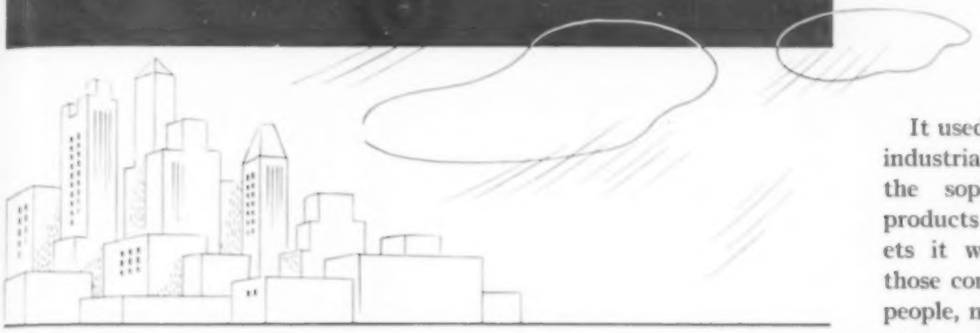
One can readily see that Mr. Lescaze's theory is soundly based upon human nature and its reactions to its own desires and needs which form the fundamental basis of all our business and social life. One might almost compare an architectural problem to "packaging and distributing problems," meaning simply that a building like the 33-story Philadelphia Savings Fund Society building is technically a package for the bank. It is the package in which the product of the bank is brought to the consumer—it is where the bank functions with its clientele. Since its distributing problem is wholly internal, the interior equipment of the bank—counters at which depositors transact business, desks of those who keep accounts, offices of the president and vice-presidents, coupon rooms and vaults, must be pleasing in appearance and satisfying in use to members of the banking staff and customers of the bank alike.

It would seem that these definite engineering and architectural principles are (*Continued on page 58*)



Lescaze's modern clock with hour spaces indicated by applied discs of brilliant red plastic material

A STRAW IN THE WIND



IN THE field of Industrial Design, it is necessary to take one's bearings about twice as often as it is in other fields. The trade winds of art and industry are forever shifting, and it is only by constant observation that we can hope to keep abreast of current developments. It is not that changes are rapid, but rather that they manifest themselves differently. A trend in design or the introduction of a new material has a different meaning to the consumer, the manufacturer and the industrial designer. To interpret some of these reactions and their meaning as a guide to the manufacturer is the major purpose of this article.

An excellent vantage point from which to make preliminary observations is the point of view of the consumer. In the final analysis, it is his response or lack of response that governs the success or failure of a product. It would not be a great exaggeration to picture this consumer today surrounded on all sides by a vast array of newly designed articles, each bidding for his favor. In the pages of catalogs, in shop windows, on store counters, these products clamor for his attention. In competing for the contents of his pocketbook, beauty of design has become as important as the former considerations of utility or price. There is no doubt that today it is the designer's influence which most frequently determines whether or not a purchase is made. Competitive products whose design has remained much the same throughout the years, find themselves gathering dust. The freshness, the individuality, the eye-appeal of the products which have passed through the hands of the modern industrial designer, exert a powerful influence on the buying public—an influence which can be measured by the flow of dollars into the cash boxes of the more progressive manufacturers.

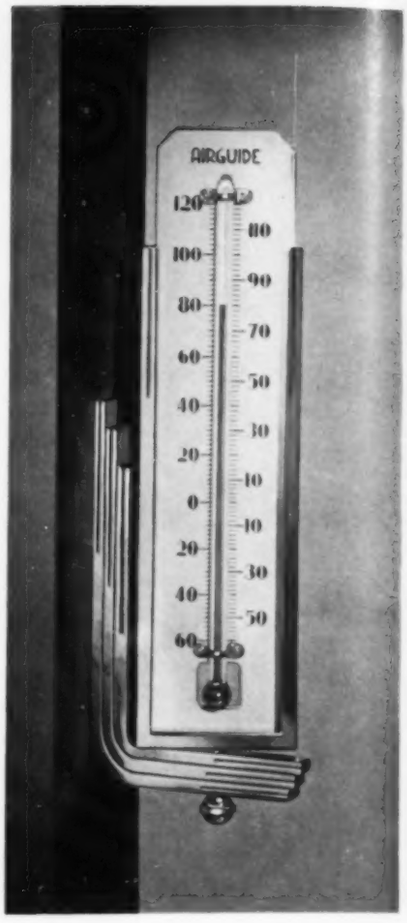
It used to be argued that modern industrial design appealed only to the sophisticated few—that for products in the higher price brackets it was valuable but that for those consumed by the majority of people, modern design was not only unnecessary but, in many cases, actually a detriment to sales.

It cannot be disputed that Industrial Design first found a foothold in products manufactured for a select clientele. Two forces, however, have changed this. Education—gradually making people aware of the possibilities of their surroundings—has made millions critical of the appearance of the things they buy. Emulation—the desire to keep up with the Joneses or go them one better—has created a demand for products possessing the characteristics of articles designed for Park Avenue. Today, we find that modern design has sifted down to articles purchased over department store counters, in chain stores and in five- and ten-cent stores. Consumers as a whole are becoming more and more conscious that a change for the better has taken place. A new consideration has entered into shopping excursions: they are vaguely aware that some products possess an

Hervey L. MacCowan

author of this article is chief designer for Fee and Stemwedel, Inc. For this firm he has designed the Spur, Eton and Deluxe Airguide weather indicators shown on the following page. Mr. MacCowan, while speaking for himself alone, has pointed out, with much clarity, a viewpoint of the importance of design, which has recently gained wide acceptance. While Modern Plastics may not subscribe to the fullest extent to every detail of this thesis, it does subscribe—along with most of the other factors in the plastics industry—wholeheartedly to his major point, that sound design and healthy sales go hand in hand

The Spur Model Airguide thermometer is made of polished chrome with a vitreous white enamel scale



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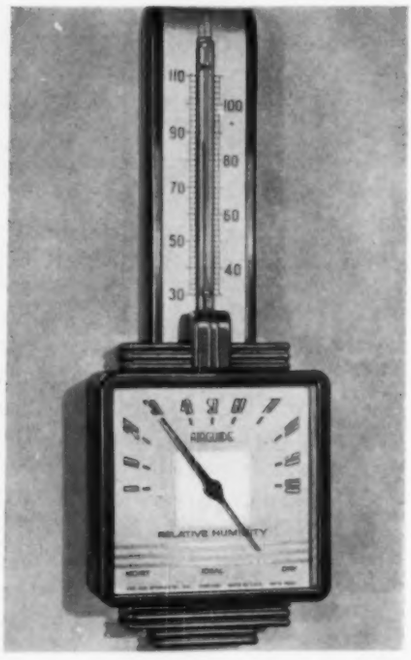
additional quality—a pleasing symmetry of form perhaps or a novel decorative treatment—that catches their eyes and arouses the age-old desire to possess.

Important, too, is the fact that the consumer is rapidly acquiring a set of critical standards by means of which he guides his buying. He has thumbed through countless copies of magazines devoted to home furnishing, has seen breath-taking interiors in the latest Hollywood cinema, has visited the World's Fair—and has consciously or unconsciously developed a taste in the things with which he surrounds himself. Today, he buys a radio as much for the fact that it is a fine piece of furniture as for the dealer's claim that he can get Buenos Aires.

How does this change in the attitude of the consumer affect the manufacturer? Two problems spring from the consumer's recognition of modern industrial design: on the left the manufacturer is confronted by a public that is aware of design as a buying factor—on the right he faces the aggressive competition of manufacturers who have seen the light and are basking in it with the aid of industrial designers. That his product has had consumer acceptance for many years no longer guarantees a nice steady business. That he has spent thousands of dollars for advertising and that he used nothing but the finest of materials no longer suffices to induce the public to buy. In addition to the above, his product today must be smartly designed, it must possess an eye-appeal great enough to withstand the competition presented by well-designed products. Unless the manufacturer can grasp the significance of industrial design as it relates to his sales, he is in grave danger of seeing inferior, shoddily-made products cut in on his sales simply be- (*Continued on page 64*)



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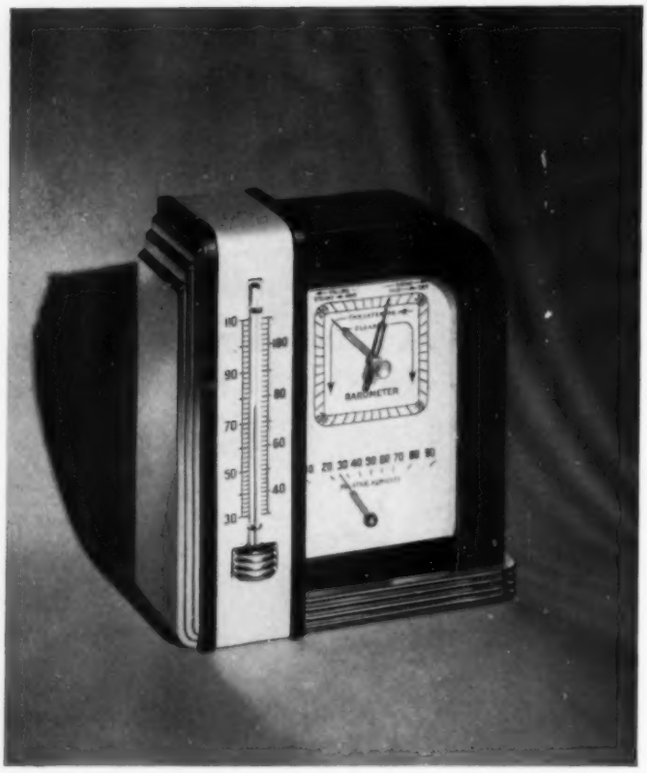
The Eton Airguide gives both a temperature and humidity reading. Its black phenolic molded case has chrome decorative trimmings



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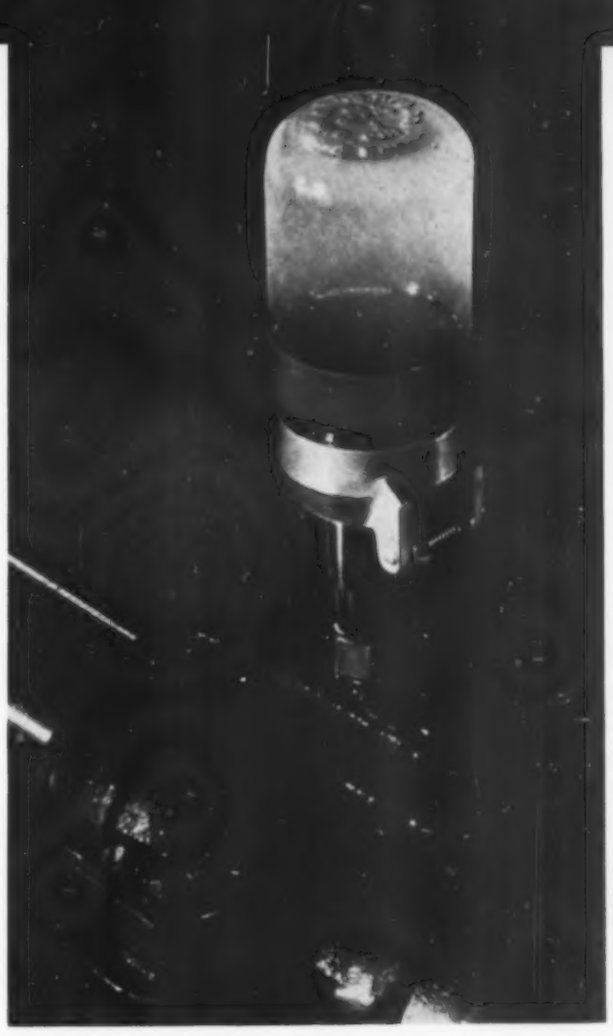
The Deluxe Airguide—telling humidity, temperature and barometric pressure—consists of a black phenolic housing with a chrome shaft—holding the thermometer—and decorative chrome fittings. Both DeLuxe and Eton moldings are by Chicago Molded Products Co.

CAN PLASTICS REPLACE GLASS?

NEW ACETATE OILER POINTS THE WAY



THE first rash prediction ventured by every plastic novice, when once he has discovered the transparent and translucent plastics, is to say, "Some day plastics will replace glass!"

In spite of British and American rumors to the contrary, no plastics has yet been developed that possesses both the qualities and the low price of glass. Yet, in at least two instances, plastics has already replaced glass for certain types of applications.

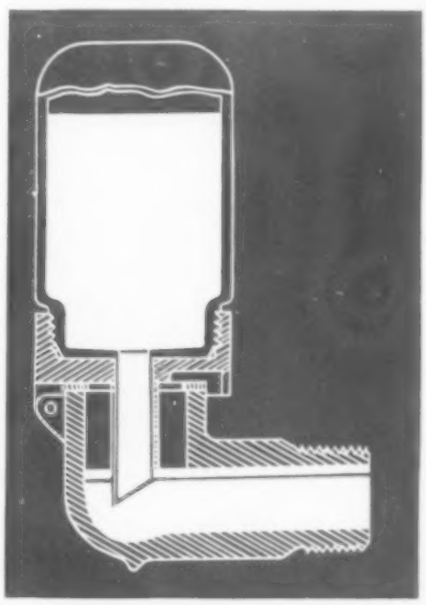
The first is the case of the cast phenolics which in jewelry, in clock cases, in lighting fixtures and in many other instances have won out over glass because of lighter unit weight, better machining qualities and richer color effects. The second glass competitor is cellulose acetate which presents a number of unusual advantages over glass for certain special types applications.

An instance in point is the new type oiler, recently marketed by Gits Brothers Manufacturing Company. This device consists of a bottle and stem attached to a hinged metal fitting through which oil is fed to the housing of the bearing to be lubricated. It was essential that the oil reservoir be of a transparent material so that the level of the oil could be ascertained at all times. For this purpose, glass would have seemed the logical choice.

But a second requirement called for a fitting that would be practically unbreakable—one that could withstand not only vibration but also the repeated shocks and actual blows to be expected for any exposed part in a busy machine. This effectually eliminated glass and led to a search for a suitable material to serve in its place.

The search ended with the adaptation of cellulose acetate, which provided not only the transparency but the necessary toughness and "unbreakability" as well. While, technically, the term "unbreakable" may be construed as a misnomer, it is well applied, for, in practice, it has been found extremely difficult if not impossible to break this fixture without deliberate intent.

Having selected the material they would utilize, the manufacturers were confronted with another unusual problem—namely, the construction of along-necked bottle. Here, probably for the first time in quantity production, a bottle of this type has been made; the molding being done in two pieces which are then cemented together. While it is doubtful whether this method could have been followed with any other material, cellulose acetate lent itself readily (*Continued on page 64*)



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The Tenite bottle and the metal parts are clearly shown in this cross-section plan. The illustration above demonstrates the transparency of the oil container

JENKINS TWO-PIECE VALVE WHEEL

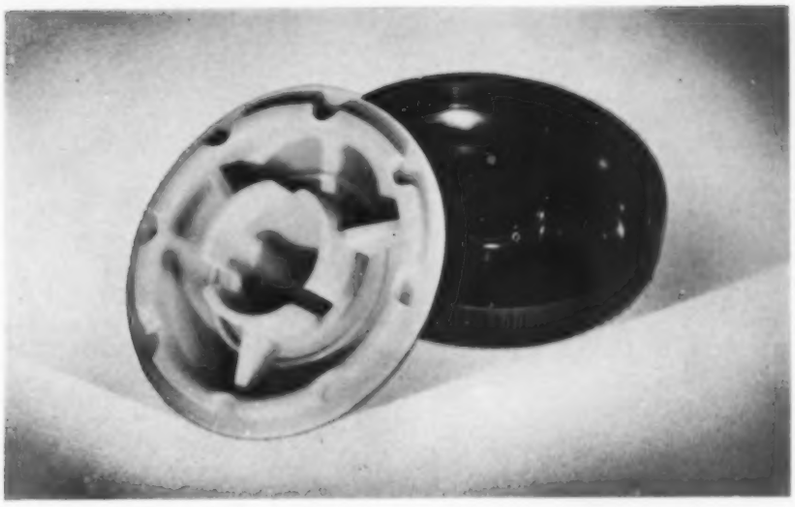
A STUDY IN INDUSTRIAL ENGINEERING

IT ALL started a little over two years ago, when one of the younger members of the Jenkins Brothers' sales-force spent a few weeks in a hospital. With plenty of time to think of such things, the young man noticed that nurses and orderlies suffered from strange burns on the centers of their palms. He inquired and discovered that these were incurred when opening or closing the valves on steam lines of sterilizing equipment. . . many of which came from his own plant.

These valves had operating wheels of cold molded material held to the shaft by a nut and washer. As the shaft grew hot, both nut and washer reached burning temperatures. . . yet it was frequently impossible for a busy operator to turn the wheel without coming into contact with this hot metal.

Returning to his office, the young man outlined a proposal to the Jenkins Brothers' executives In effect, he said: "Give me a valve with no exposed heat-conducting surfaces, one which can be readily recognized as being on a hot line and I will guarantee to sell it to the entire hospital supply trade."

The challenge was accepted and preliminary designs were drawn up. These called for a base-wheel of molded material which could be attached by nut and lock-washer to the shaft and a top portion, likewise



molded, which would cover the formerly exposed metal.

Though the solution sounded simple, a number of problems immediately arose which presented discouraging difficulties and almost defeated the combined efforts of the company's engineers and those of the material suppliers and molders. A primary requirement demanded that the valve-wheel be practically indestructible. A second requirement called for a top-plate that would snap easily into place, yet one that would remain permanently in position under all heat and use conditions. A third requirement called for different colors to indicate various types of pipe-lines—steam, steam-return, hot-water, cold water, etc.

A number of different arrangements were tried, using

experimental molds, in an attempt to find a joint solution for the first two problems. Because the wheel-base received more heat than did the cover, it was found that a different ratio of expansion occurred, permitting the snap-in cover to drop away when in use. Finally a form of construction was devised whereby the expansion of the more-heated base actually tightened its grip upon the holding flanges of the cover. It was also discovered that a black phenolic base would expand under heat while a molded cellulose acetate top would have a slight contraction under operation conditions. Thus the joint between the two actually became tighter when the fixture was under heat.

The use of cellulose acetate for the cover permitted of the attainment of the desired distinguishing color effects. Further identification was obtained by molding the name of the line into the cover in relief lettering. Thus a single set of molds now produces all the phenolic bases while slightly varied molds are used to fabricate the cover plates. Some of these are now being made with the identifying marks of Jenkins customers.

The design and construction are patented and the Jenkins firm has discovered since announcing this handle, that it provides so many advantages, for firms using it as standard equipment, as to remove their entire valve from price competition to a large extent. Since the handles are not obtainable separately, manufacturing customers have been found more than willing to specify the entire valve to gain the advantages of the handle. This condition, of course, would not have occurred were it not for the already high reputation of the Jenkins valves, yet it is a significant commentary on the effectiveness of molding as a sales stimulator when the molded piece is only a part of the product.

Although originally designed only for sterilizer use, the Jenkins Company quickly discovered that it had a remarkable product on its hands—one equally applicable to many other types of valve. The company now contemplates offering the handles for radiator controls. Here, particularly on the new type, in-the-wall radiators appearance is a governing factor and the attractive cellulose-acetate heads can be made available in colors complementary to those of the room.

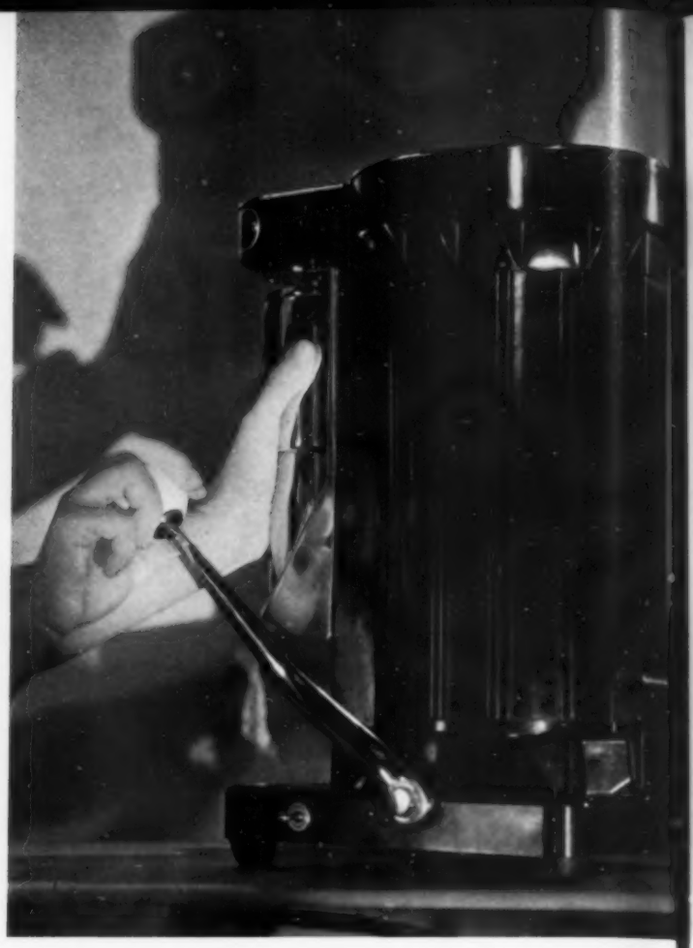
Thus, in spite of the fact that more than two years were consumed in experimental work, in spite of the thousands of dollars spent on research, the company already finds its investment justified. Already, within a few months, sales have run to several thousand.

Credit: To Bakelite Corporation; for material and research in creating molded base.

To Tennessee Eastman Corp.; for Tenite used in molding cover plates and for research in development.

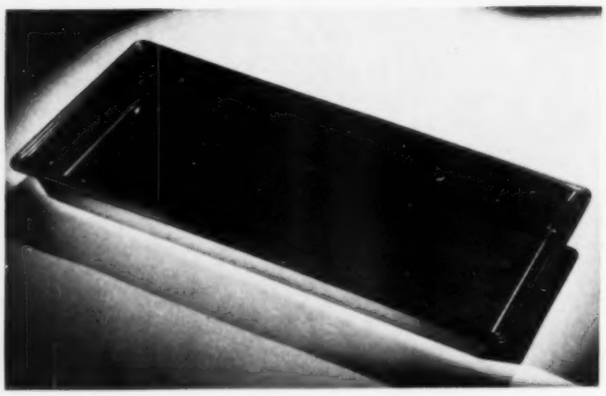
To Diemolding Corporation; for experimental molding during initial period and for molding of present-model wheels.

This iron stand contains the electrical contacts which heat the *cord-less* iron as long as it is left in up-tilted position. Thus, in actual ironing, the instrument is free of all incumbrances, while, at rest, it regains its needed heat. The elimination of the cord directly attached to the iron permits its being turned into any position without tangling. The base is designed and engineered by Plastic Merchandisers, Inc., and molded of Durez and Bakelite by the General Molded Products Co.



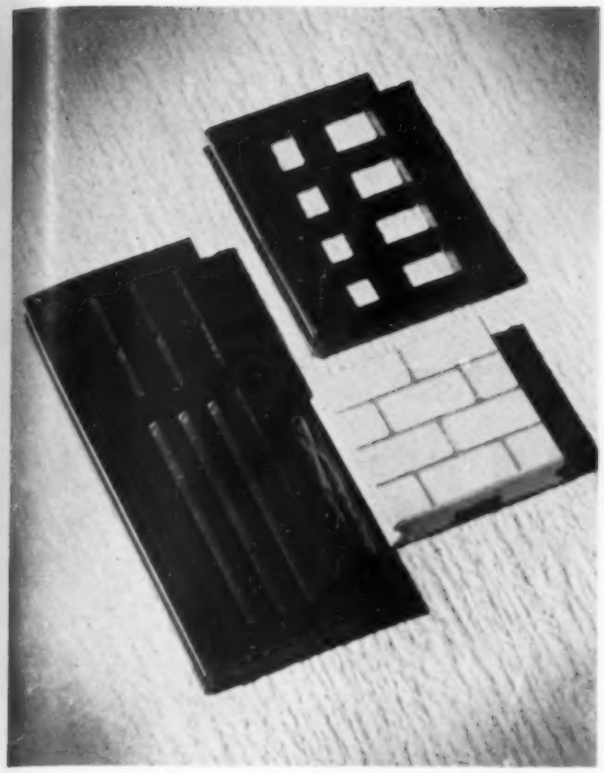
A three piece plastic chasis is used by the Andis Products Co. to house the mechanism of its new high-speed whipper. While plastics were specified because of the weight reduction they afforded and their elimination of finishing costs, the company reports remarkable sales in spite of comparatively high prices, due to the superior appearance and finish of the new model. The base, fluted column and top were molded of Durez by the American Record Corp.

developments of the

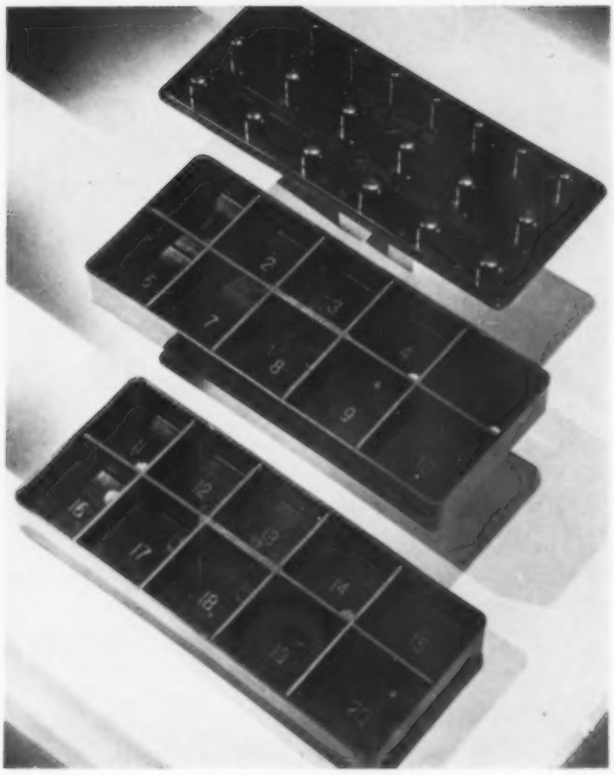


To facilitate the display of its candies by dealers, the W. F. Schrafft & Sons organization now furnishes them with molded, phenolic trays. Advantages: non-tarnishing, non-denting, easily cleaned. Prime advantage: dealers who discarded metal trays use and display these

For use as a card-container and score pad or as a memo-desk pad, the Eu-ja Company presents the Multi-case. The device consists of a hinged-top box with a molded housing holding a paper roll. Molding is by Kuhn and Jacob Molding and Tool Company



From Great Britain comes a new adaptation of plastics in the form of molded building units for a child's constructional toy. Here illustrated in actual size are a door, a window and a wall section. Note the grooves which facilitate assembly into model houses. The units are manufactured by The Plimpton Engineering Co. of Liverpool, and shown through the courtesy of British Plastics



To overcome the breaking of partitions when a paper box was used, the J. Bird Moyer Company now packages its Copper Bands, sold to the dental profession, in a two-tier container, molded of Bakelite by the Molded Insulation Company. As an additional advantage, the molded box permitted of the addition of a series of gauges at the top of the box to facilitate selection of the proper size band

month

Another application for phenolic plastics which shows its toughness and resistance to abrasion is the molded roller-skate wheel. Preferred for indoor rink skating, the molded wheel reduces noise and wear and reduces scratching and scraping of the rink. Weight of the complete skate is also reduced. A new ball-bearing model by Union Hardware is shown. Photo courtesy General Plastics, Inc.

PLASKON

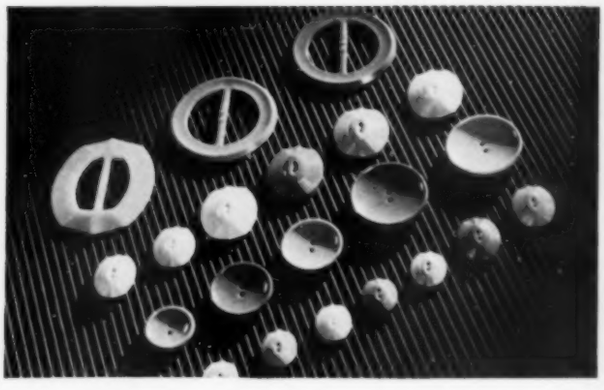
POKER CHIPS:

Next time you're letting a stack of blues slip lovingly thru your fingers, look at the chips. They are likely to be the Plaskon ones which the Portland Billiard Ball Company is marketing with great success. Old hands like the smooth feel, and their "just-right" weight; and no matter how high feelings rise (and chips bounce) Plaskon toughness prevents chipping or cracking. They are pretty unusual-looking, too, what with a striking silhouette inlay—depicting an appropriate sport scene—on either side of each chip.

This ability to combine effectively with any metal is another nice thing about Plaskon. Besides the blues, there are naturally enough the whites and the reds in Plaskon—molded color. Molded by Portland.

BUTTONS:

In a prize fighter it's color, but in buttons it's permanent color that makes the gate heavy and the customer happy. The new spring buttons of the American Record Corporation have that virtue because Plaskon's molded color is literally a part of



the material. No amount of Monday scrubbings will ever fade their beauty or crack their strength. Plaskon buttons stay sewed on, too, because Plaskon surfaces mold smooth with no jagged hole edges to cut the thread. And no thin remnants across the holes to dull machine needles and retard production. Incidentally, Plaskon found there was so much to be done about buttons in general that it established a special Button Advisory Service. You are cordially invited to present your problem.

MOLDED COLOR

APRIL 1935

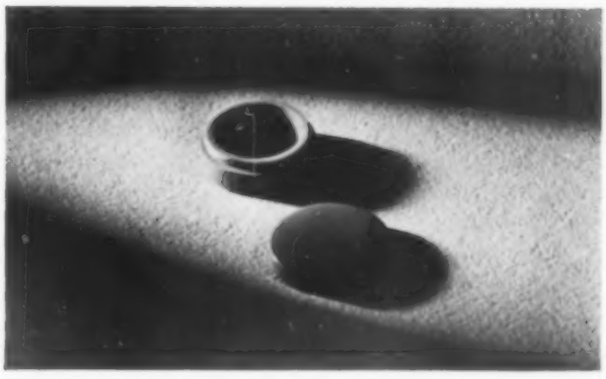
LIGHTING FIXTURES:

There is in production in the factories of the Waterbury Button Company a complete and colorful line of Plaskon—molded color—lighting fixtures. Heralded by engineers and designers as a triumph of molding precision and interior decoration, this line has advantages—advantages too good to be true before Plaskon was utilized as the material for lighting fixtures of all kinds. There are the beautiful pastel shades which permit numberless color harmony and contrast possibilities; the strong insula-

tive quality combined with resistance to water, grease, and acid; the permanent finish which cannot peel and does not craze. With this pioneering line of fixtures Waterbury Button becomes a leader of this highly competitive field. Plaskon, in turn, is proud of its part in the undertaking.

ROUGE BOX:

A lot has been said about Plaskon's infinite color range and permanent color beauty. Packagers have come to value both; customers to appreciate both and to buy the merchandise Plaskon encloses. But there's more to this plastic than meets the eye. The Arrow-Hart & Hegeman rouge boxes in red and blue and ivory Plaskon are strong as they are colorful; their tops and base fit tightly together because Plaskon is easily threaded; and rouge put inside them just can't go stale because Plaskon is heat-resistant and grease-proof. Technical detail, you say, and unrelated to that packaging weathervane —eye appeal. And, ordinarily, you'd be right. But



with Plaskon true service does not end with the sale. It begins then. Molded by Arrow-Hart & Hegeman.

Long-wearing qualities are claimed for this airplane control pulley molded of phenolics by the Molded Insulation Company. The ball bearing center core is treated as an insert in the molding operation

Replacing the customary rubber inkwell cap, the Edward E. Babb Company now offers molded phenolic caps which are not attacked by the corrosive action of the ink

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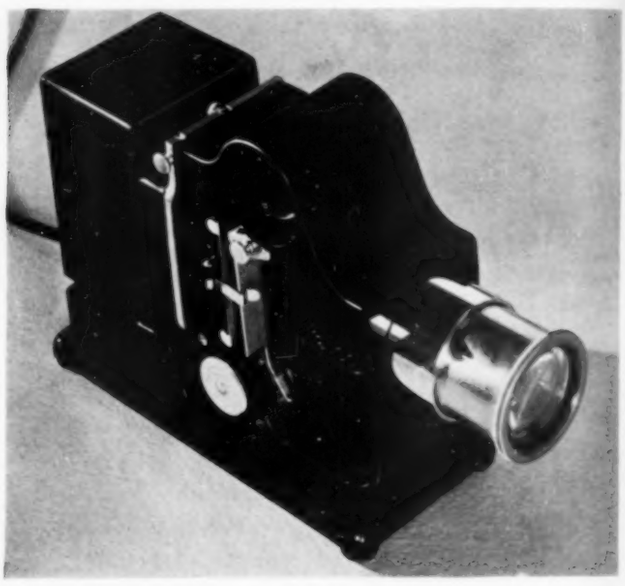
The new Umino projector, produced by E. Leitz, Inc., uses a case molded of a special phenolic material. Photo Courtesy of Bakelite Corporation



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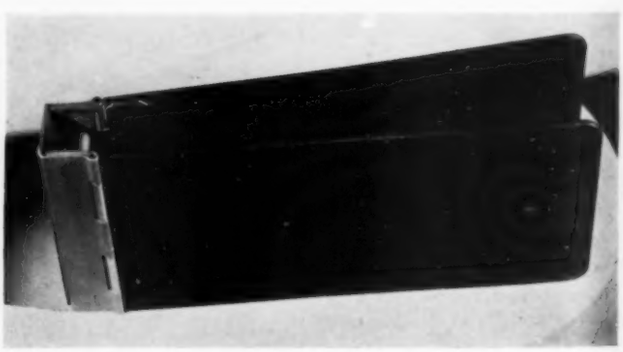
Streamlined molded phenolic knobs are used, in conjunction with a die-cast housing, on the control unit of the new RCA auto-radio



To overcome the extreme wear common to most meter-reader binders, Remington Rand uses laminated plastic side-panels, made by the Panelyte Corporation, with a pebble grain on a canvas base lamination

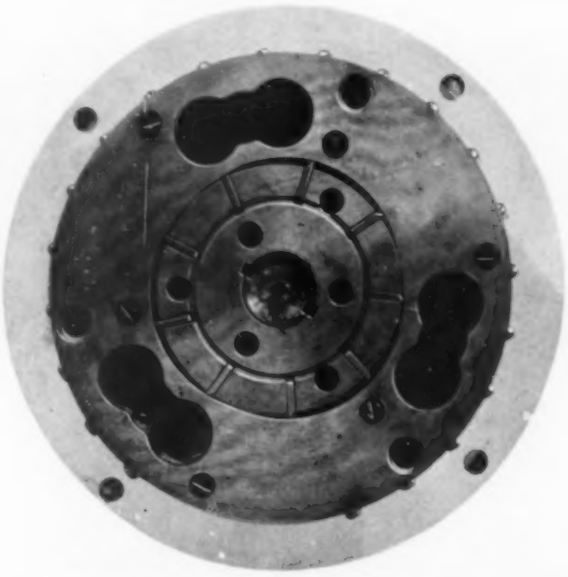
LAMINATED PLASTICS OFFERS INDUSTRY GREAT POSSIBILITIES FOR IMPROVED DESIGN AND PERFORMANCE

By N. S. Stoddard

PLASTICS DEPARTMENT
GENERAL ELECTRIC CO.

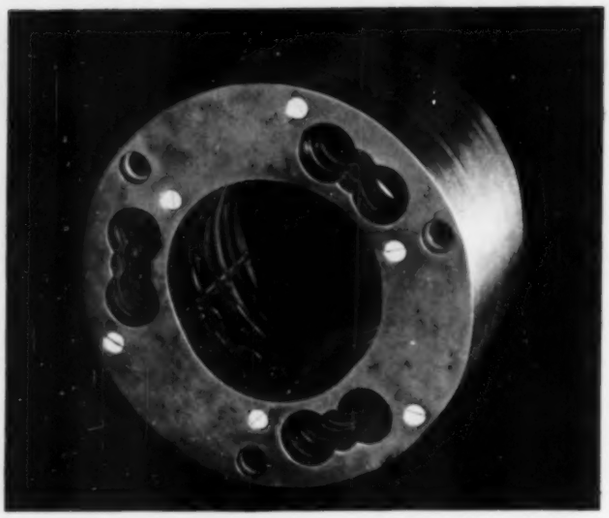
In the past few years, applications in the industrial field for laminated plastics have developed rapidly with extraordinary results and beneficial savings to the users.

Such rapid development of laminated plastics can be attributed to their combined properties of mechanical strength, electrical insulation, resilience, chemical stability, lightness, high specific strength (ratio of specific gravity to tensile strength), moisture resistance and decorativeness; a combination of properties provided by no other material. For instance, a rayon spinning pot can be made of other materials of adequate specific strength but they are now made of laminated plastics because laminated offers not only the necessary specific strength but also the property of resistance to acid. It is for industrial applications such as this, where the advantages of these combined properties tend to improve performance, that laminated plastics are being used.



An end view of the nonmetallic pump, showing the assembly of the laminated stator, rotor and vanes

The laminated rotor of the H. A. Smith pump



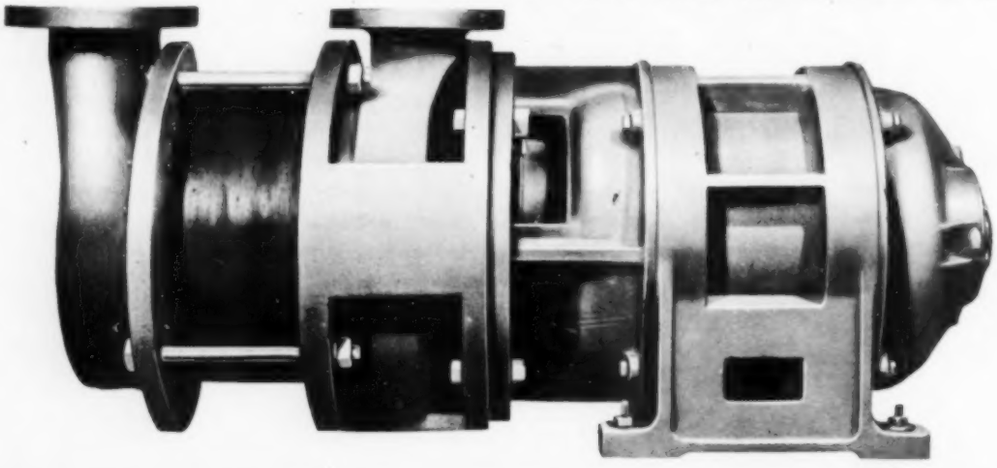
The laminated stator—even the screws are covered with laminated plastics before complete assembly

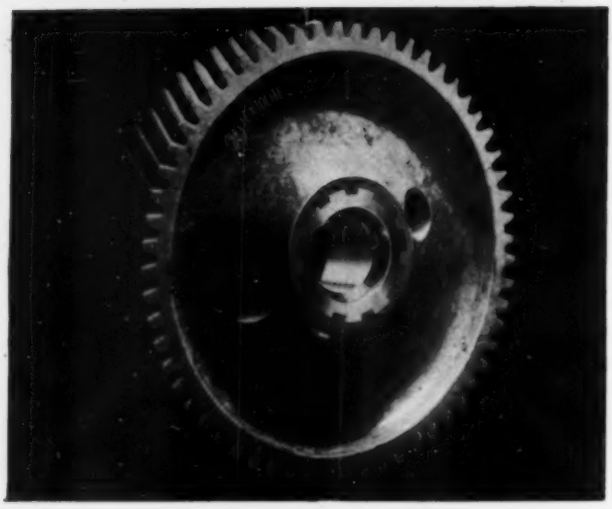
The completed nonmetallic pump ready for installation

Perhaps one of the most interesting, recent adaptations of laminated plastics was developed as the result of the death of some of the New York Aquarium's rarest fish. Death was due to contaminated water caused by the metal pumps which pumped the water into the various tanks. Because these deaths were costing the New York Aquarium hundreds of dollars, it was apparent that something had to be done to overcome this pollution.

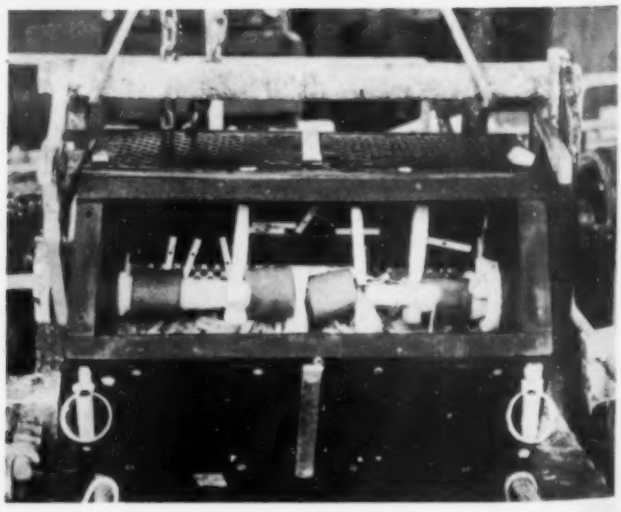
The H. A. Smith Pump & Motor Company, for years developers and manufacturers of special pumping equipment, successfully produced for the New York Aquarium a pump made entirely of nonmetallic materials, using five grades of Textolite laminated in its construction—one grade for the stator and rotor, another for the keys, a third for the sleeves, the fourth for the caps and end plates, and a fifth grade for the vanes. So far, two of these pumps have been installed and have proven highly successful, mechanically, in addition to being good life insurance for the fish.

We have cited this incident of the non-

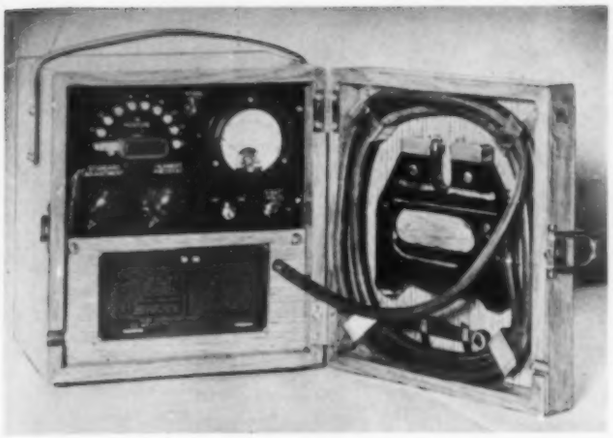


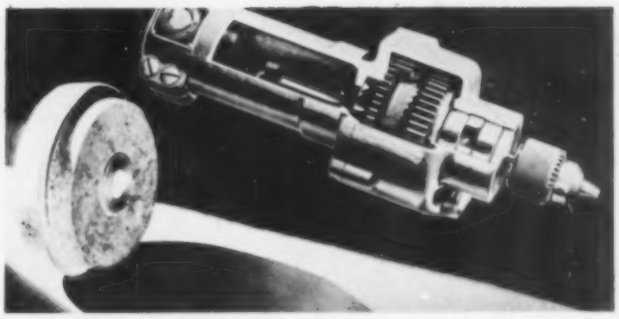


AUTOMOTIVE INDUSTRY



CHEMICAL INDUSTRY

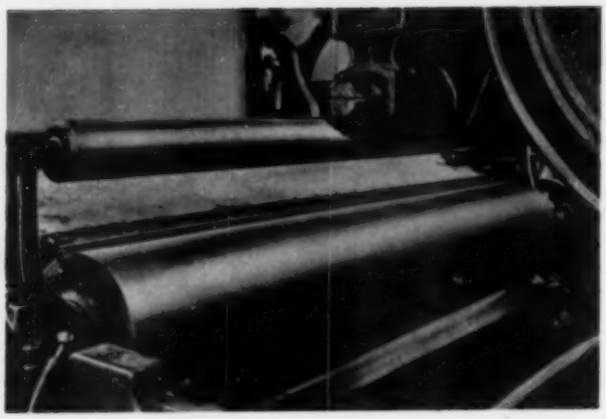




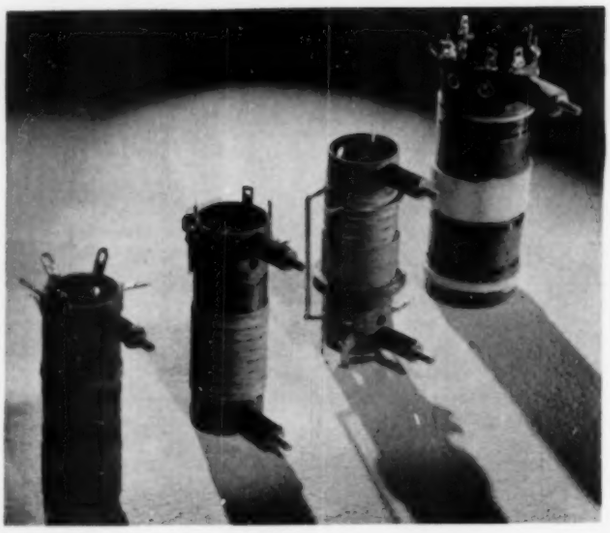
MACHINE TOOL INDUSTRY

ELECTRICAL INDUSTRY

	PROPERTIES	BENEFITS TO USER
AUTOMOTIVE INDUSTRY Laminated automotive timing gear	High mechanical strength Resilience Unaffected by hot oil Minimum of wear	Uniform tooth strength Quietness Permanency of properties Longer life and fewer replacements
CHEMICAL INDUSTRY Laminated plating barrels.	Electrical insulation Unaffected by acids	Prevention of electrolysis Longer life
ELECTRICAL INDUSTRY Laminated meter panel.	Electrical insulation Mechanical strength Lightness Easily fabricated Decorativeness	Simplified design Reduced weight Engraving, punched parts, etc. Fine appearance
MACHINE TOOL INDUSTRY Laminated double-cone clutch.	Resilience High specific strength Nonmetallic	Better performance—by softer engagement Longer life No scoring or fire-cracking
PAPER INDUSTRY Laminated doctor blades.	Do not score Wear slowly and evenly Do not warp	Protect rolls from marring Longer life Keep rolls absolutely clean
RADIO INDUSTRY Laminated tubing for coil forms.	Low power factor Low electrical losses Unaffected by atmosphere Easily fabricated	Complete insulation assuring selectivity and excellent tone quality Permanency of properties Good machining qualities
REFRIGERATING INDUSTRY Laminated breaker strips for refrigerator door.	Low heat conductivity Decorativeness Mechanical strength Odorless	Heat insulation Sales appeal Simplified construction No tainting of food
STEEL INDUSTRY Laminated roll-neck bearings.	High impact strength Water lubricated Low coefficient of friction Do not score or adhere to metals	Longer life 100% lubricating savings Greatly reduced power consumption Protects the surface of the roll-necks
TEXTILE INDUSTRY Laminated loom pickers.	Accurate dimensions Unaffected by atmosphere Resilience Mechanical strength	Easy adjustment Easy on the shuttle Longer life



PAPER INDUSTRY



RADIO INDUSTRY

REFRIGERATING INDUSTRY

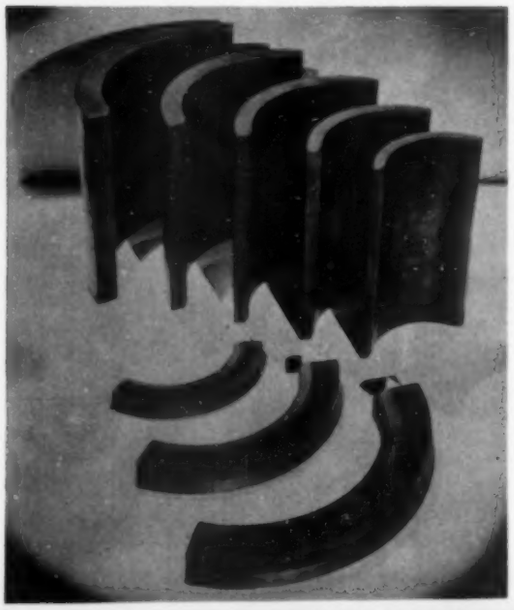
STEEL INDUSTRY

metallic pump not because of its uniqueness but to exemplify another case where laminated plastics had more to offer in the form of properties than any other material; laminated plastics did not effect the water or vice versa.

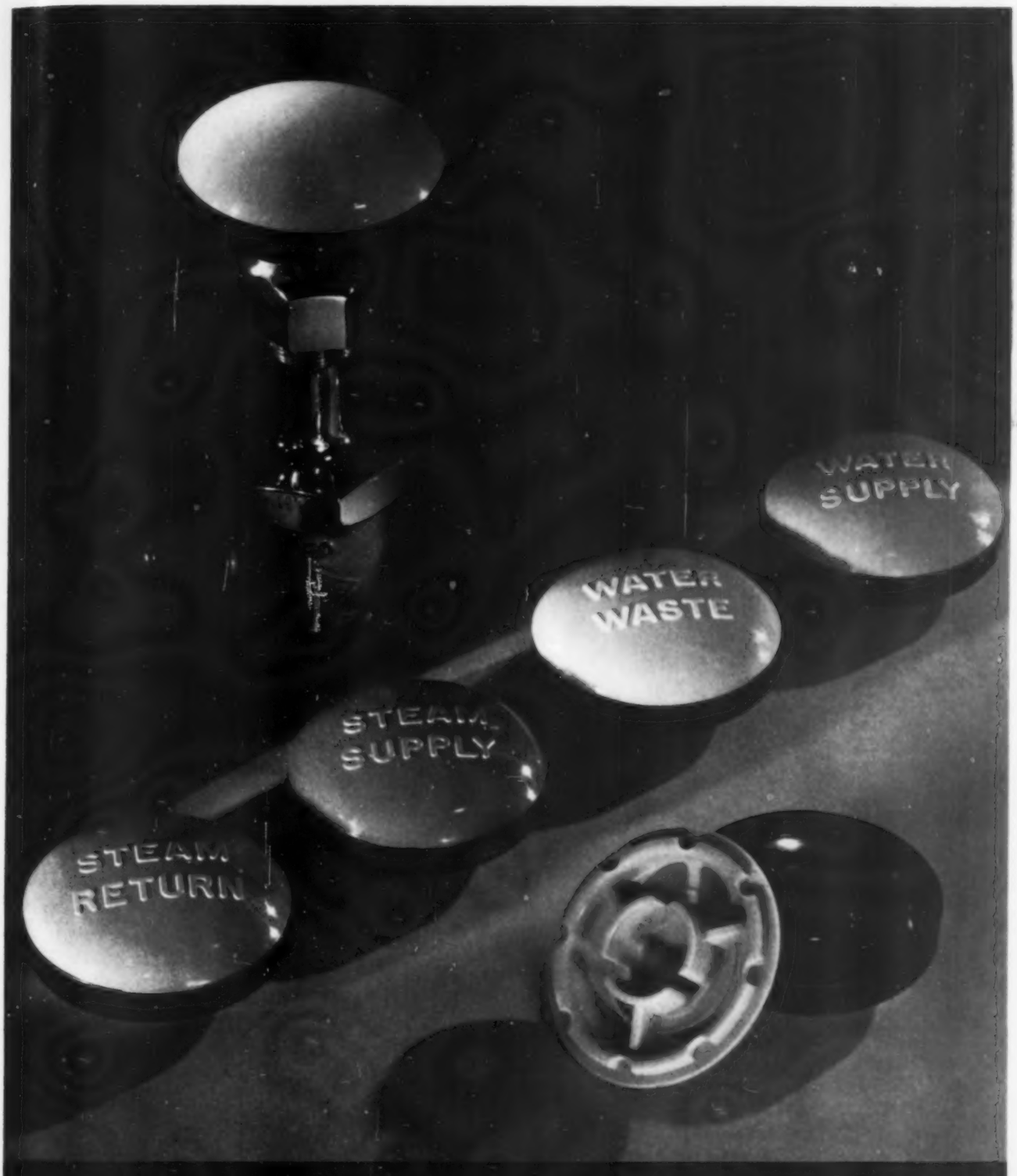
With this development, an entirely new field for laminated plastics is opened. What bearing will it have on pump construction? We know of one pump manufacturer who has adopted laminated pump blades, replacing nitrited steel because much to his surprise he found that laminated blades, though not as hard as nitrited steel, improved the efficiency of his pump and increased the life of the blades.

But let us not limit this only to pumps! There are hundreds of other applications for laminated plastics in the industrial field which are to be found in most every industry; paper, textile, chemical, radio, electrical, automotive, steel, machine tool, refrigerating, and many others. On the following two pages are illustrations showing uses of laminated plastics in each of the above mentioned industries.

It is convincing proof, therefore, that with such a unique combination of properties plus the results of present industrial uses, laminated plastics have a definite place in the progress of industry. Their importance will be even more pronounced as soon as the designer and engineer in industry realizes that with more careful consideration and complete knowledge of this new type of material they can simplify the design, improve the performance, lower manufacturing costs, or extend the life of their product or a part of their product by its use. To help them work out these problems, the manufacturers of laminated materials maintain staffs of application engineers.



TEXTILE INDUSTRY

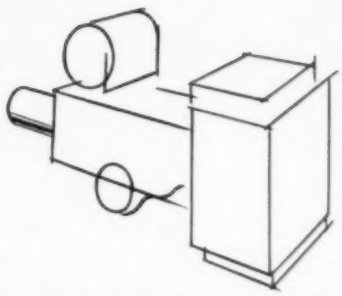


TENITE *in colors*

Interchangeable caps of red, green, blue, and gray Tenite, molded by the Diemolding Corporation, identify these new Jenkins Sanitary Valve Wheels. For beauty and utility combined, modern designers turn to Tenite, the plastic of unexcelled strength and unlimited color range. Write today for illustrated booklet and samples of Tenite.

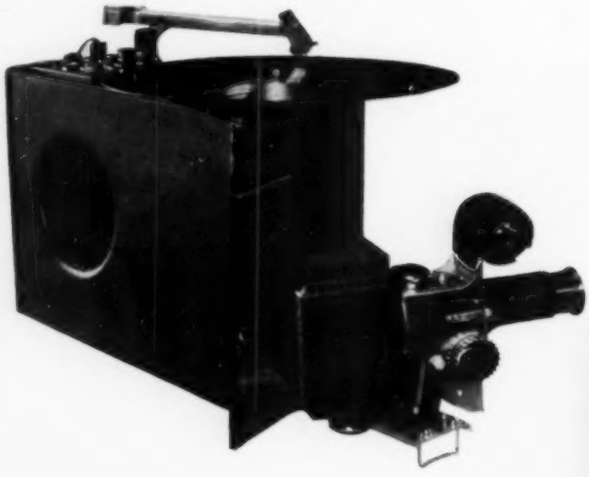
TENNESSEE EASTMAN CORPORATION *(Subsidiary of Eastman Kodak Co.),* **KINGSPORT, TENN.**

WHEN METALS WONT DO . . . TRY MOLDING



HALF way between the old-fashioned slide-projector and sound movies stands the Visomatic film-lecture system, a modernized version of the illustrated lecture widely used for sales-training, propaganda and advertising. Visomatic Systems, Inc. supplies projecting equipment which throws "stills" upon a screen while a sound record delivers the "canned" lecture. . . both the sound equipment and the projector being contained in a single handy portable unit. The company also produces both the recording and the photographic film used in the device.

In its original equipment, Visomatic Systems utilized an aluminum reel to house the rolled-up film. This was found reasonably satisfactory for the short lengths of film needed for a fifteen minute lecture. However, as the utilization of this equipment increased, a larger reel was found necessary to accommodate film sufficient for half hour and full hour lectures. For such a reel, aluminum would not do, the metal being too easily dented and the film too easily scratched.



A molded reel was therefore planned, the final design consisting of two pieces. One, a spool closed at one end and slotted to permit of the passage of the film; the other an end piece so constructed as to spring into place and close the container. This involved a delicate and extremely accurate molding job to insure easy removal of the films while simultaneously insuring a close fit for the two interlocking sections. As now made, accidental dropping away of the side plate is practically impossible, yet removal, when desired, is effected by a flip of the hand.

It was expected that the molded reel would cost substantially more than an equivalent reel of the old type. Yet, with a run restricted to approximately ten thousand, the cost of molding was found to be thoroughly consistent with that of the previously used spool.

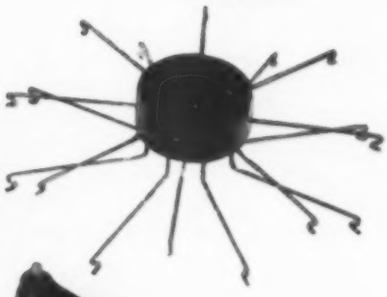
In use the molded reels have proved more than satisfactory. They show no wear, they provide the fullest possible protection for the valuable film, they form an integral part of the projector itself and. . . most important. . . they neither break nor dent.

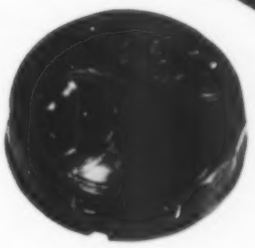
Credit: To Boonton Molding Company for designing and molding of reel.

To Bakelite Corp. for molding material.

Here we see the new molded reel standing next to its far less sturdy metal predecessor
Above may be seen the Viscomatic projector with the reel in position

You can't over-magnify the importance of this TINY MARK ON YOUR MOLDINGS





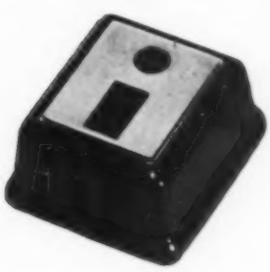
Just two small letters in an inconspicuous spot on your moldings. Yet they are your guarantee of perfect accuracy, perfect care, perfect finish. To the many electrical manufacturers we serve, they provide assurance against breakdown. To our commercial clients, these brands insure against returned merchandise and customer dissatisfaction.

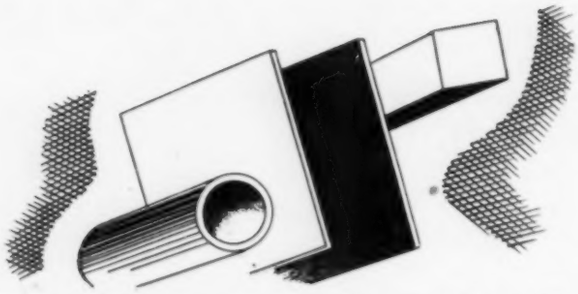
For behind this brand stands one of the oldest molding organizations; a group of experienced designers, technicians, and workmen who have spent their working lives in improving upon old methods and devising new ones. Their fullest cooperation . . . backed by the most modern of laboratory and plant equipment . . . is yours to call upon. Write to—

Auburn Button Works Inc.
Auburn, N.Y.

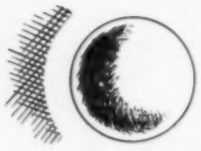
ESTABLISHED 1876

AUBURN SKILL
is typified by the products here shown, recent additions to the hundreds of moldings we have in continuous production. Note the variety and intricacy of the work.





Speaking of Synthetic



by Whiting V. Shepard
TOLEDO SYNTHETIC PRODUCTS, INC.

FEW pseudo-scientific words have caught the public fancy to such an extent as the adjective, synthetic. And like most words which the layman has accepted without much thought as to its meaning, synthetic has crept into every-day language until it serves to describe almost everything from gin to ginger.

Synthesis, however, from which the adjective is derived, may best be defined as the combining of parts or ingredients into a whole or compound; the opposite of analysis, or resolution into simple elements. Thus, synthetic or man-made materials, such as glass, steel or plastics, are fundamental materials, in a class with wood, stone, ivory and hides. A synthetic material is definitely not an artificial material, which imitates the natural, and pretends to be what it is not, as for example, artificial leather and paste diamonds.

None the less, the adjectives synthetic and artificial have come to be synonymous as commonly used. The reason for this unfortunate union may be traced back to three widely separated phenomena, which may be inadequately mentioned in the inverse order of importance as follows: First, during the last World War, Allied propaganda gloated ceaselessly on the fact that Germany, her back to the wall, was being forced to seek "*synthetic*" cotton and rubber, etc. What Germany really sought was *artificial* cotton and rubber; i.e., in imitation of the natural, which they could no longer obtain in the necessary quantities.

Secondly, in spite of the fact that gin must by definition be synthetic, the era of prohibition connected synthetic and gin for the first time. "Bathtub" was the more descriptive adjective, but for some unknown reason "synthetic" was the more popular. And the association of the aching head of the morning after with the synthetic gin of the night before, certainly did little to raise the term synthetic in the public estimation. Ironical but true.

Lastly, and most important, during the last hundred years man has rarely synthesized a material except to replace a material then in use with the idea in mind of producing something cheaper. By way of illustration, we have only to point to the ivory billiard ball, which scientists attempted to synthesize for many years, in the course of which attempts Celluloid was discovered. It is difficult, in fact, to name any synthetic material which was not sought as a cheaper replacement for a valuable (perhaps not intrinsically, but so because of scarcity) material then in the *status quo*.

The phenolic plastics, when first brought out, were quite generally thought to be chiefly important because an imitation wood effect could be obtained in the molded piece. Yet why, in Heaven's name, should synthetic plastics, a fundamental material, imitate wood of which there even now is no scarcity? Why? The answer is obviously because a molded mahogany radio cabinet was far cheaper than real mahogany.

And thus it is that the synthetic materials have come to be considered as second-rate, cheap, imitations of God-made, natural materials. This, of course, inspite of the fact that the natural materials may be counted on one's fingers: wood, stone and basic metals from the earth, hides and bone from our four-footed compatriots.

It is not out of place to sketch briefly the development of synthetic materials from the earliest known period of man's existence. He hadn't progressed very far into the stone age, perhaps no further than the Neolithic period, before he tired of using only what he could pick up, or pry out of the ground. First, then, he fashioned implements such as the eolith and coup de poing, with which he defended himself and slew his meat. Then he wanted something from which to eat his juicy repast of dinosaur steak and spinach greens. Result: The first synthetic article, the pottery dish, made by moulding carefully prepared clay into the required shape, and firing it after it had been mixed with sand or other micaceous material. Indeed, although out of place here, it is not too much to say that art for art's sake is in a large measure coincident with the discovery of pottery making, for the broad surface of an unbaked pot simply demanded decoration.

Apparently encouraged by his success in making what nature had not provided for him, man passed into the bronze age, the first truly synthetic age. He learned that an alloy of copper and tin produced a metal which could be fashioned into implements far superior to those made of stone. To be sure, he was imitating the natural, but it takes quite a stretch of the imagination to arrive at the conclusion that he considered it a shoddy imitation.

To this day man has never ceased experimenting with the combinations of what is available in, on and above the earth, and fortunately for the rest of us, the more persistently curious men have been successful in pro-

(*Continued on page 61*)

● Above left: Formica doors at Pennsylvania Station New York. McKim, Meade & White, Architects.

FORMICA DOORS for Beauty and Service!

● Above right: Coupon Booth Doors East River Savings Bank Walker & Gillette, Architects.

FORMICA doors made by veneering Formica sheet on wood cores or by laying Formica sheets on metal fire proof doors, combine great durability with beauty and attractiveness.

These doors may be inlaid with decoration, and may be had in a wide variety of color.

Formica does not change color or react with the atmosphere. Is unaffected by washing solutions. It provides in short a door that will never need refinishing or renovating.

THE FORMICA INSULATION COMPANY
4620 SPRING GROVE AVE. CINCINNATI, O.

● Swinging doors between the Kitchen and Dining room—Stevens Hotel Chicago. Holabird & Root, Architects.

FORMICA

FOR BUILDING PURPOSES

NEW DENTURE FORMING UNIT USES MOLDED CASE

by Franklin E. Brill

GENERAL PLASTICS, INC.

DENTAL science's newest aid—a machine for forming metal denture plates by electrolytic action—has been recently announced by the Hanau Engineering Company of Buffalo, N. Y. One of its most interesting features is that the entire case of the machine is molded of phenolic plastic material.

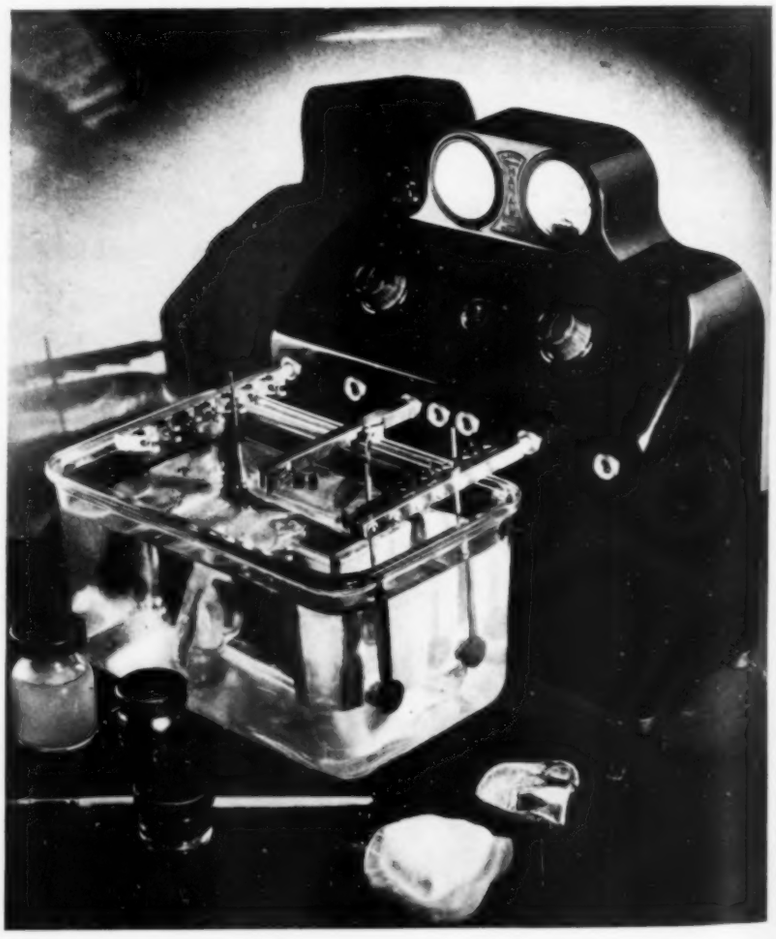
Metal denture plates have many advocates in the dental profession, largely because the plates, when once made, cannot become ill fitting because of dimensional change due to moisture absorption in the mouth, and because their excellent heat conduction reduces possibility of gum inflammation. Heretofore, plates have been made either by casting molten metal or compressing thin sheets, both of which methods required the building of hard female dies—very expensive and laborious. However, with this new Hanau unit, the metal plates are formed electrolytically directly on a composition impression taken from the patient's gums. It is quicker, less costly, far more accurate.

Briefly, the Hanau machine consists of the electrical transformer and control unit, housed in the molded case with dials and ammeters, terminals for duplicate cathodes and electrodes, and either one or two depositing tanks. The stainless steel electrodes, which can be used singly or in multiple for simultaneous use of two baths, project over the glass tanks, and the composition impression of the gums is coated with a conducting material and suspended in the solution. First a copper coat is deposited, then a silver backing and then the whole plate is stripped from the form and rhodium-plated. A perfect reproduction of the patient's gums is thus formed, the new teeth are imbedded and the complete plate is finished.

The reasons for Hanau's choice of molded plastics for the case are several: It is too intricate in shape for metal stampings, and so large—over twelve inches in height—that a die cast metal case would have been excessively heavy for easy carrying. Furthermore, extra insulation would have been required in a metal case, whereas the molded case formed its own insulation. Another important reason was that the acid used in the electrolyte attacked the enamel finish used on metal cases, but had no effect on the inert phenolic plastic case, nor was there any possibility of the integral lustre of the molded case wearing off from constant scuffing since it is part of the piece not applied. Finally, the molded case was light, yet amply strong, could have lugs, inserts, holes, bezels, trade marks, etc., molded in the one operation, and would never rust, chip, peel, corrode or check.

Credit: To General Plastics, Inc., for Durez molding Material.

To Norton Laboratories, Inc., for molding of case.



New Ideas

● To take advantage of the light weight and other desirable properties of synthetic resin plastics, while at the same time retaining the strength and impact resistance of metals, a new camera case is molded from a suitable synthetic resin composition and is strengthened by a light but serviceable outer jacket of metal. If it is desired still to retain the superior decorative possibilities of plastic materials, outer panels of synthetic resin may be applied to the metal jacket. The new case permits no more leakage of light into the interior than an all metal case. (Paul Franke and Reinhold Heidecke, French Patent 776,121.)

● Since molded screw caps for collapsible tubes became popular there have been a number of attempts to make the body of the tube also of an organic plastic material. The chief reasons for desiring the change are lighter weight (important in export trade where customs duties are based on gross weight) and resistance to attack by the contents of the tube, thus eliminating the protective coatings which in many instances must be applied to metal tubes. The chief difficulty has been in reconciling the needed rigidity in the head of the tube with the necessary pliant nature of the collapsible portion. This problem has now been solved by joining a soft, pliant tube of cellulose ester or synthetic resin to a rigid head of hard rubber, hardened synthetic resin or a hard cellulose ester or ether plastic. The joint may be made by a fusion method, similar to the welding of metals, or by a solvent softening method. (Emil Pollak and Rudolf R. Schäfer, German Patent 605,329.)

● A new German product known as "Zellusilber" offers some very attractive possibilities in decorative art. It consists of silvered celluloid, that is, a high grade transparent celluloid composition which has been chemically silvered to give beautiful mirror or reflection effects. The new material is not limited to silvering; gilt, bronze and dull lustre effects can also be produced. Buttons, combs, hair ornaments, hat trimmings, letters for signs, vanity mirrors and picture frames are among the articles which can be made especially attractive with the material. In molding, electrical heat is preferred to hot water heat since the temperature should not be above 160° F. (Heinrich Wiesenthal, Kunststoffe, Feb., p. 42.)

● A recent French invention proposes to make tires skidproof by incorporating small Bakelite pellets, or lead shot or the like, in the tread surface. This idea, whether practical or not, at least reveals a line of thought apart from the usual trend of those seeking new uses for synthetic resin products. (Ewald Goldstein, French Patent 764,663.)

● Temporary crowns for teeth to be porcelain crowned are made by forming a tough shell of ethylcellulose or other cellulose ether around a wax core, melting out the core in hot water, and filling the cellulose ether shell with cement. (Heko-Werk Chemische Fabrik A.-G., German Patent 603,400.)

● To combine the desirable properties of synthetic plastics with the necessary mechanical strength and rigidity of a metal construction, centrifuge buckets are now made of metal with an outer shell of a fibrous plastic composition made from spinnable fibres and a synthetic resin. This outer shell is bonded to the wire-wound metal core of the bucket by means of a non-metallic binder. (James R. Hiltner, General Electric Co., U. S. Patent 1,992,914.)

● Electric lamp holders of the bayonet type are improved by being made with a molded body of a plastic having good insulating properties, and with the skirt of socket formed from a paper tube molded, together with a synthetic resin, at the same time with other parts of the body. The paper tube is preferably laminated from paper and a phenolic resin. The hardening time of this resin is adjusted to that of the resin used in the body of the holder, so that both are properly cured in a single operation. (F. W. Payne, General Electric Co., Ltd., British Patent 419,612.)

● Containers for medicinal tablets are molded in two sections with complementary recesses which register with each other when one section is inverted over the other, so that individual compartments are formed for pills, tablets or capsules. These containers may be made in ornamental designs, or may bear printed matter such as directions for taking the medicine, etc. (F. R. Goshawk, British Patent 418,909.) As a similar invention, boxes for soft medicinal products are made with fitted celluloid or synthetic resin trays, molded with recesses to receive capsules or the like. The boxes may be partitioned or two or more of the molded trays may be fitted, one over another, into a box of suitable size. (Laboratories Galenigues Vernin, British Patent 419,919.)

● Gas mask eyepieces, or transparent bodies for gas masks, are made from non-flammable vinyl resins, especially vinyl chloride which has been further chlorinated after polymerization. To facilitate molding, or to improve transparency or for other reasons, the vinyl chloride resins may be compounded with softeners or with transparent resins. (Dynamit-A.-G. vormals A. Nobel & Co., British Patent 419,586.)

● In molding shoe stiffener blanks from celluloid with a fibrous absorbent base such as swansdown, the desired firm and fleshy translucent condition of the blank, for ease in handling and skiving, is achieved by using methanol as the solvent, with an aliphatic amine for viscosity reduction, and water as the gelatinizing agent. The use of an amine, by lowering viscosity, permits higher cellulose concentrations than hitherto and so improves the quality of the blanks. (D. B. and R. B. MacDonald, British United Shoe Machinery Co., Ltd., British Patent 419,951.)

● A new material for molded insulation, with high impact strength and breakdown resistance, is made by condensing phenols with wood fibre instead of with formaldehyde. Insulation made from the new molding powder has excellent electrical properties and resistance to deterioration by water. (S. Ushakow and E. Freidberg, Kunstsoffe, vol. 24, pp. 277–281.)

OUTGUESSING THE COLOR TRENDS IN PLASTICS

by Waldon Fawcett

HOW are plastics planners to beat the gun on color rotation? By what means may the makers and marketers of plastic products obtain promptly, or forehandedly, the tips that will enable them to discount shifts in color popularity. Yes, to anticipate and forestall, if you please, the intermittent or seasonal reshuffling of best-selling colors. Must the plastics industry reckon with its fad—colors apart from its staple-colors?

Here is a boquet of plastics problems that are very real and very immediate. No member of the industry may look the situation squarely in the face and say that color-forecasting is an academic detail outside the responsibilities of the practical executive. Plastics production must dance to the tune of current styling of feminine apparel, motor cars, house furnishings and what not. This, in turn, means that plastics must reflect the color adventuring which goes on in these extremely color-sensitive lines.

It's a question too whether the plastics community is not, of all the color-dependent industries, the most in need of dependable advance information on switches in color favoritism. In the apparel and novelty trades, by contrast, are many small producers who may wait for a color tide to set in, then jump nimbly into "Me—too" policies, and ride the wave to profits. More leeway is needed for plastics' moderate or large scale production. Furthermore, plastic specialties and accessories may not safely tail the color procession. If plastic products are to win consumer-acceptance by matching new or seasonal innovations, it is essential that the fabricator have sufficient warning to bring out his line with the fresh burst of color modes.

Well, what is to be done about it? Let us take up the possible resources in order, always understanding that the more restricted the scope of a plastics line the less the producer need worry over color faddism outside his immediate vicinity.

First, have a look at the staff—artist and service-studio sources. Is color informative and advisory service within the province, or function, of the plastics designer or color planner? Or, putting it differently, to what extent may a plastics manufacturer or molder leave it to his designer to guide him to a color selection in sympathy with the general direction of color preferences?

Mr. Arthur S. Allen says that, most definitely, color intelligence service is the job of the color counsel. "In fact" says Mr. Allen, "I know of no other source from which the manufacturer can secure really correct guidance in color planning."

Even if taken at full face value, the above prescription does not take care of the situation for the plastics factor who is not in intimate and continuous contact with a professional color planner. Assuming that a free-lance color strategist can speculate most shrewdly on the direction in which the color procession is moving it is patent that he must be enlisted on a retainer basis if the plastics client is to be primed to the minute on every move in the color game.

This puts it, more or less squarely, up to each member of the plastics community to organize his own private vigilance service, as a check-up on the changing fortunes of color. So, our main task is to examine the open and underground channels of color information which may be tapped by the independent producer of plastics.

At the top of the heap, undoubtedly, stand the plastics producers' own customers. These translators of plastic wares have their own means of gathering the news of color sequences. Some have their own Color Bureaus. Others sense the set of color-flow from the reports which come to Package Design Bureaus, Trade Mark Bureaus, and other new-fangled listening posts that are appearing in the business picture. If the plastics executive can persuade customers to pass along this gossip on color—futures, he has the best of previews because he is getting a lead on the color-leanings of the parties that purchase and distribute his own products.

If he would be reassured by the authoritative note in color prognostication the plastics listener may turn to several institutions that specialize in this field. These agencies have been set up primarily to serve the dry goods trade, the apparel industries and kindred lines. Lacking a clearing house for color information within the plastics industry, the safest bet for eavesdroppers on color manipulation is to listen in on the confidences of the bureaus of the very color-responsive trades (say, the dress industries) which can give the proper color-cues to plastic suppliers.

The Cotton-Textile Institute, Inc. of 320 Broadway, New York, which has an alert New Uses Section, can sometimes drop a friendly hint on color tendencies in its field. The Taylor System of Color Harmony at 425 Fifth Avenue, New York is not a source for futures on color but may be drawn upon when it is a matter of reconciling color schemes.

As the time approaches for unveiling the annual models, individual manufacturers of motor cars are notoriously cagey regarding the fresh colors to be introduced. But the National Automobile Chamber of Commerce is in position to give plastics planners a general idea of the quarter in which the color compass is pointing, if assured that the information is for legitimate, confidential use. In the same spirit, the national associations of paint and varnish makers may be approached for the secrets of forthcoming color cards.

Food colors might appear, (*Continued on page 59*)

LITERATURE

● BRITISH PLASTICS YEAR BOOK—1935

British Plastic, London, Eng. (15 Shillings)

This seven hundred page annual is the fifth of a series unmatched for its completeness. Its application to American conditions is, of course, limited in the sense that names and terms differ from those commonly in use in this country. Yet so detailed is its information and so authoritative its data, that many Americans interested in the fabrication or use of plastics will find it definitely of value. Particularly useful will be found the sections dealing with the individual types of plastic materials, detailing their applications, their chemical and physical properties, and their limitations.

Of more limited interest to American readers are the sections detailing sources of raw materials, plastic materials, molders and fabricators, etc. Somewhat over a hundred pages are given over to the listing of plastic users (i.e., manufacturers who use plastic in the fabrication of their products) while a large section is devoted to newer developments in the making or application of plastics. The book is profusely illustrated.

● REILLY COAL TAR PRODUCTS

Reilly Tar & Chemical Corp.

This little booklet lists over a hundred products and groups of products derived by the Reilly Tar and Chemical Corp. from coal tar. Short descriptive data are appended under each listing. Of particular interest to plastic molders and users of plastics is the section devoted to the Reilly Corporation's molding compounds. Copies may be obtained without charge from the Reilly Tar and Chemical Corp., Indianapolis, Ind.

● WHAT IS FORMICA?

The Formica Insulation Company

This thirty-two page booklet describes the various forms of Formica laminations, both decorative and industrial and illustrates its descriptions with details as to actual products or installations of the particular form of Formica under consideration. Thus electrical, ra-

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dio, automotive, x-ray, chemical, electroplating, and other industrial uses are covered. A number of pages are devoted to the methods of machining, drilling, tapping, punching and sawing Formica, with detailed instructions as to best tools and tool speeds for each type of material. A number of illustrations showing the process of manufacture will be found useful by those who plan to utilize these materials. Copies may be had on request.

● CATALIN and CATALIN FABRICATORS

The Catalin Corporation

These two little folders fill a long felt need in supplying the prospective user of cast phenolics with both a description and samples of the material and a listing of the major firms engaging in custom fabricating of the Catalin Corporation's products. The first folder describes the physical properties of the material and suggests a number of applications. It likewise details the methods of machining and fabricating catalin and the types of stock shapes available. Contained inside are a number of samples illustrating—in so far as a limited grouping can—the many varieties of color, mottling and translucency available. The second booklet supplements this data with a listing of over thirty firms which engage in custom fabricating with annotations as to the particular types of work each firm specializes in. This listing is broken down, for convenience, by territories. Copies of both folders may be obtained upon request.

● 13th ANNUAL OF ADVERTISING ART

The Book Service Company ($6.00)

In these colorful volumes the Art Directors Club of New York has annually portrayed the year's progress in advertising art (and, hence, in all commercial and industrial art) as demonstrated by the exhibits at the annual Art Directors' Club Shows. While of little direct bearing on plastics, plastic users with an eye toward design will find much of value in this volume. New trends in product designs can be discerned often by the trend of design in the more flexible field of advertising. Similarly color indications can be gained by a consideration of the colors more common to advertising. The volume is, in its very nature, profusely illustrated and it is worthy of comment that man of the finest among the industrial designers are here represented in their advertising work.

In the March issue of MODERN PLASTICS, the price of Memmler's Science of Rubber was erroneously referred to as $5.00. The volume, which is published by the Reinhold Publishing Corp., is priced at $15.00.

Keeping posted

Van Doren and Rideout, Industrial Designers of Toledo, Ohio, have opened an office at 1112 Merchandise Mart, Chicago, in order to more effectively serve their mid-western clients. The office is in charge of Ward Adolph, who for a number of years was associated with the Libbey Glass Company. The firm will continue to maintain its principal office and studios at 1217 Madison Avenue, Toledo.

The M-R-H Laboratories, Dowagiac, Michigan, announce a new Colorimeter, a scientifically designed instrument which accurately matches or compares colors, registering variations indiscernible to the human eye. It is stated that with this device it is possible to match shades to a degree far beyond commercial requirements. The instrument is light and compact, completely encased in molded phenolics. It operates from any 110 volt light socket. Color comparisons are made very simply. . . the instrument is placed over the surface of the standard color, the switch is turned on, and readings are taken. The same process is repeated with the color which is to match the original. The comparison of the readings indicates discrepancies "to the millionth degree." The device is actuated by a photo-electric cell. Photo, Courtesy of Bakelite Corporation

Keeping posted

Lukens Steel Company has issued a profusely illustrated booklet descriptive of its "World Largest Plate Mill and Its Products," copies of which are available on request to MODERN PLASTICS readers. Firms using moldings which involve the utilization of metal inserts will find therein much useful information.

Applications of modern materials, created by the chemist, for the home and for industry will be the feature of **Bakelite Corporation's** exhibit at the Industrial Arts Exposition to be held in Rockefeller Center, New York, April 15th to May 15th.

The company's display will be centered around the general theme of the Exposition, The American Worker of Modest Means. The manifold uses of resinoid materials in the modern home, and in building modernization, will be emphasized, as well as their applications in the manufacture of home appliances, in transportation and communication equipment. These will include commercial paints and varnishes based on Bakelite synthetic resins, a variety of modern articles made of Bakelite molded and cast resinoids, wall paneling, and modern furniture of Bakelite laminated, and draperies and upholstery of Revolite, a flexible water-proof fabric treated with a special Bakelite resinoid.

The **Pyrometer Instrument Company,** New York, recently brought out a New surface pyrometer line intended for all industries where surface temperatures are to be measured quickly and accurately, whether they are flat or curved, stationary or moving.

The new instrument is self-contained, rugged, quick-acting, accurate and designed for heavy duty work over a long period of years. The instrument can be furnished in Type "A" for flat surfaces or in Type "B" for curved surfaces. Due to a patented clamping device the contact and the reading of actual temperature no longer have to be made simultaneously, as the indicating needle will stay fixed at the highest temperature.

While contacting the thermo couple, a red button on the indicator housing is pressed and held for a few seconds. The pressure on the button is released before removing the thermocouple from the surface being measured, and in so doing a fixed indication of the temperature measurement is obtained. Another pressure on the red button causes the pointer on the indicator to return to its zero setting.

The Type A for flat surfaces can be furnished with scale ranges from 30 to 400° F.; 30 to 600° F.; 100 to 900° F. and 100 to 1400° F. The BOW Type for curved surfaces is furnished with ranges: 30 to 250° F.; 30 to 400° F.; 30 to 600° F.; 100 to 900° F. and 100 to 1000° F. Extension handles can be furnished to meet individual conditions and requirements. New illustrated catalogue will be sent on request to the company.

Keeping posted

The firm of **J. H. Tyson & Staff** has been incorporated with headquarters and plant at Wilkes-Barre, Pennsylvania, as designers and fabricators of displays and decorative architectural installations. J. H. Tyson has been elected president of the firm which formerly operated under his name as an unincorporated company. R. W. Tewkesbury, vice-president, and General Manager, will have charge of the firm's New York office, while C. Aaronson will be secretary-treasurer.

Consolidated sales of the **Monsanto Chemical Company** and its subsidiaries for 1934 were 14 per cent greater than for 1933 and the largest in the company's history, according to the annual report. Earnings for 1934 as previously reported by Edgar M. Queeny, president, were $2,771,629.29 or $3.20½ a share on the 864,000 shares outstanding. These earnings include Monsanto's proportion of the undivided profits of controlled companies not consolidated and uncontrolled companies. Earnings for 1933 after giving effect to the 100 per cent stock distribution of last April amounted to $2.57 a share, a record surpassed only by 1934.

Net current assets are reported at $7,540,832, an increase of $2,224,291 over last year, and total assets at an all time peak of $26,904,720. Expenditures for research in 1934 totaled $456,356, an increase of 11 per cent over 1933. A much larger amount has been budgeted for 1935.

In his report, President Queeny states that Monsanto received no direct benefits from the NRA. Consumption of chemicals by the so-called heavy industries was only slightly greater than in 1933. New avenues of consumption of some chemicals and satisfactory demands from the plastic, rubber, paint and pharmaceutical industries, however, aided sales.

"The Securities Act of 1933 greatly contributed to the difficulties of financing by American industry," Mr. Queeny states in his report. "Monsanto was fortunate to have a British subsidiary to form the vehicle for the procurement of needed additional capital. In September, 400,000 pounds out of an authorized 500,000 pounds of 5½ per cent non-voting cumulative preferred stock in Monsanto Chemicals, Limited, was sold through bankers to the British investors at 102½ of par. The confidence of the British investing public in their money, as well as in the chemical industry, was evident by the heavy over-subscription of this issue which bears no sinking fund nor guarantee by the parent company. It is now selling on the London Stock Exchange at a substantial premium over the issue price. The proceeds of this issue will be used for expansion of our British properties and to repay our American treasury for past advances."

Keeping posted

The **C. E. Waltman Organization** has increased its staff of stylists and moved into larger and new quarters at 737 N. Michigan Avenue, Chicago.

Much of the Waltman Organization's work in recent years has been in the home products field, on merchandise and packaged goods bought primarily by women.

The Board of Directors of both **The Swann Corporation,** in which Monsanto acquired a controlling interest in 1933, and **Monsanto Chemical Company** approved a contract and will recommend to their respective stockholders the merging of The Swann Corporation into Monsanto. If ratified the stockholders of The Swann Corporation will receive one share of Monsanto common for each $4\frac{1}{2}$ shares of Swann common.

The Swann Corporation has headquarters in Birmingham and a plant in Anniston, Alabama. A Swann subsidiary corporation, The Provident Chemical Company, has a plant in St. Louis, Missouri, for the manufacture of monocalcium and disodium phosphate; another subsidiary, the Wilckes, Martin, Wilckes Company, has a plant at Camden, New Jersey, where lamp black, bone ash and phosphate salts are produced. The Anniston operations are electrochemical and produce phosphoric acid and its derivatives, calcium carbide, ferro phosphorus and abrasives.

Edgar M. Queeny, president of Monsanto, stated that, as the operations of The Swann Corporation are non-competitive with Monsanto, the acquisition increases the diversity of Monsanto's income and provides new avenues for development in the electrochemical field.

The Swann Corporation has gross assets of about $5,500,000 and had net earnings for 1934 of approximately $396,000.

The absorption will give Monsanto gross assets in excess of $32,000,000 and after the consummation of the transaction, Monsanto will have approximately 965,000 shares outstanding.

Negotiations have recently been completed between the **Polytechnic Institute** of Brooklyn and the **United States Shellac Importers' Association** for an enlargement of the cooperative research work on shellac which has been carried out by the Polytechnic Institute during the last six and one-half years.

The project is part of an international research program which is sponsored by the Shellac Importers' Association and the Government of India through its Lac Cess Committee. This committee maintains the Indian Lac Research Institute and the London (England) Shellac Research Bureau. The results of the investigations carried out at these centers of research will be exchanged to avoid duplication of effort.

Keeping posted

Monsanto Chemical Company has acquired the Atlantic Chemical Company of Billerica, Massachusetts, manufacturers of heavy chemicals. This company will be consolidated with the Merrimac division.

Robert J. Moore of **Bakelite Corporation** was re-elected Chairman for 1935–36 of the American Section of the Society of Chemical Industry at the March 8th meeting of the Society. Other officers elected for the ensuing year are: W. D. Turner, Columbia University, Vice-Chairman; Foster Dee Snell, Foster Dee Snell, Inc., Secretary; J. W. H. Randall, Consultant, Treasurer.

New members of the Executive Committee are: Wm. H. Gesell, Lehn & Fink, Inc.; Elmer K. Bolton, E. I. du Pont de Nemours & Co.; J. B. Rather, Socony-Vacuum Corporation, E. R. Weidlein, Mellon Institute. These new appointments are in addition to the following other members of the Executive Committee who remain in office: A. E. Marshall, Consultant; Gustav Egloff, Universal Oil Products Company; Charles A. Lunn, Consolidated Gas Company; J. G. Detwiler, Texas Company; Lincoln T. Work, Columbia University; James G. Vail, Philadelphia Quartz Company; Wallace P. Cohoe, Consultant; and Arthur D. Little, Arthur D. Little, Inc.

The forty-third annual report of **General Electric Company** for the year 1934, shows profit available for dividends of $19,726,044, equivalent, after $2,575,074 of regular 6 per cent cash dividends on the special stock, to 59 cents a share on 28,845,927 shares of no par value common stock, compared with $13,429,739, or 38 cents a share on the same number of shares in 1933.

Regular cash dividends of 60 cents a share on both the special and common stock amounted to $19,881,453, resulting in a deficit from operations of $155,410, which was taken from surplus.

Orders received amounted to $183,660,303 during 1934, compared with $142,770,791 during 1933, an increase of 29 per cent.

Sales billed amounted to $164,797,317 during 1934, compared with $136,637,268 during 1933, an increase of 21 per cent. The orders received exceeded the shipments by a substantial amount, so that unfilled orders were greater at the end than at the beginning of the year.

Current assets at the end of 1934 amounted to $177,269,050, and current liabilities were $17,461,338.

Inventories, after deducting reserves, are carried at $51,313,973, compared with $45,467,409. The increase of 13 per cent resulted from a 29 per cent greater volume of orders received, and from a larger amount of unfilled orders at the end of the year.

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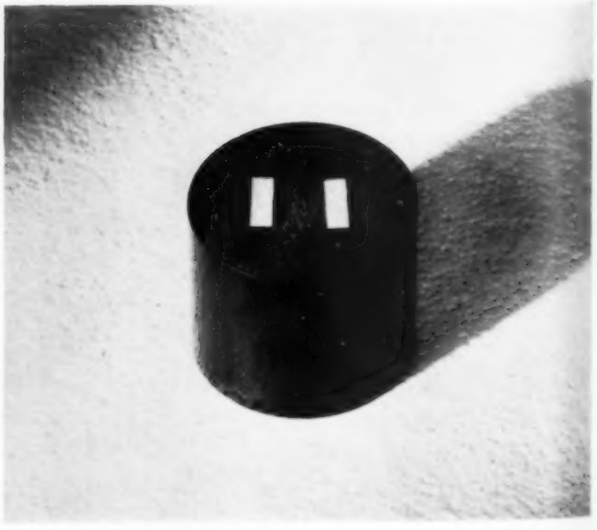
The Company spent $5,263,322 on new plant in 1934, and wrote off depreciation amounting to $7,335,997, compared with $6,179,511 in 1933. The net book value at which plants were carried at the end of 1934 was $39,852,194, compared with $42,242,493 at the end of 1933.

The report reveals that the average number of employees during 1934 was 49,642, compared with 41,560 in 1933, and average annual earnings of all employees was $1515 and $1330 respectively, an increase of 13.9 per cent. Between March 1, 1933 (approximately the low) and December 31, 1934, the number of employees on the payroll increased 36.7 per cent, and the total annual payroll rate increased 71 per cent to $81,300,000.

NEW WAY OF MOUNTING METALS FOR MICROSCOPIC ANALYSIS

Metallurgists and geologists are quite frequently confronted with the problem of mounting metal specimens which are to be examined microscopically. Specimens like small wires, sheets, springs, or powders, or any other small parts, have to be mounted for obvious reasons. Other specimens may be mounted to prevent curvature of the field where the mounting serves as a support. Still other samples should be mounted because a standardized shape will greatly facilitate uniform pressure during the grinding and polishing process.



It is quite evident that a metal specimen large enough to be held in the hand conveniently requires considerably more time to grind and polish than if a very small specimen is mounted securely. The saving in time of the mounted specimen is due not only to the

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smaller size, but also to the characteristics of the mounting medium and its uniform shape.

Several research laboratories have recently perfected a new method of mounting small specimens in molded phenolics. The process is simple and quick, and enables a standardized routine and uniformity in grinding and polishing operations. This new method provides:

1. Absolute adherence of the molded parts to the specimens.
2. Freedom from relief polish, margins, or crevices.
3. Uniform shape of mounting and convenience of handling.
4. Reagent resistance.
5. Time saving and economy.

A new hydraulic press has been designed especially for the metallurgical and geological laboratory. This press has been developed by the Wilkens-Anderson Company of Chicago, Illinois. The use of molded phenolics for mountings is advantageous because the mountings will not heat up. They are convenient to handle and grind better than the soft alloys used previously. Bakelite molded holds the specimens much more firmly. It will not clog grinding wheels. The molded material can easily be brushed off from abrasive wheels or emery paper.

Any metal specimen can be mounted easily. The operation is so clean and so rapid that it should soon become a standard routine in metallurgical and geological laboratories. Still another advantage of using molding material is that various colors may be selected to obtain the best contrast with specimens.

R. H. Dunham, president, **Hercules Powder Company,** after the annual organization meeting of the Board of Directors announced the election of the following officers and members of committees for the ensuing year:

R. H. Dunham, president; C. A. Higgins, vice-president; J. T. Skelly, vice-president; T. W. Bacchus, vice-president; C. D. Prickett, vice-president; N. P. Rood, vice-president; G. G. Rheuby, vice-president; L. N. Bent, vice-president; C. C. Hoopes, treasurer; E. B. Morrow, secretary.

Executive Committee: R. H. Dunham, chairman; L. N. Bent, C. A. Higgins, C. C. Hoopes, G. G. Rheuby, N. P. Rood, and J. T. Skelly.

Finance Committee: J. T. Skelly, chairman; R. H. Dunham, C. A. Higgins, C. C. Hoopes, C. D. Prickett, and G. G. Rheuby.

The Board of Directors also declared the regular quarterly dividend of $1\frac{3}{4}\%$ on Hercules preferred stock. This is payable May 15 to stockholders of record May 3, 1935.

A new X-ray shield has been developed by **Joseph C. Rah & Company,** Chicago, Illinois, using Bakelite Laminated in place of other types of materials. This shield is designed for portable shock-proof X-ray equipment for industrial purposes, such as X-raying castings and joints. Laminated phenolics are used, rather than other materials, because they act as a good insulator at the 75,000 volts necessary in X-ray work, and still remain opaque to X-ray radiation, particularly in the vicinity of the target. This new type of X-ray shield can be produced at much less cost than other types, and yet it contains all of the properties required in a serviceable shield.

The shield is made by wrapping a laminated tube on a mandrel and curing it hard enough to permit machining. A groove is then cut into it and lead foil of the proper thickness is rolled in. The thickness of the lead depends upon the penetrating powers of X-rays. Additional varnish-impregnated paper is wrapped on the top of the first one, which contains the lead strip, and the whole shield is cured properly. This laminated tube, when tested, was opaque to X-rays generated by 125,000 volts and resisted a flashover of 130,000 volts.

WILLIAM LESCAZE DEFINES DESIGN

(*Continued from page 22*) often overlooked in the enthusiasm of newly created plans in many fields of endeavor. They might well be applied to any sound plan to serve as an anchor and prevent its flying off on some irrelative tangent, and the complete detail of the plan as a whole should be more thoroughly considered to assure its success.

Solving the definite American problem of today with materials of today offer those interested in the extended use of plastic materials a wide open opportunity for educational and demonstrative efforts. Too few architects and designers are thoroughly acquainted with the intrinsic value of cast and molded phenolics and ureas as a material of today. True, some know the material well. Others know about plastics, and have a vague idea of their value and use in certain directions. But their knowledge, generally speaking, is all too sketchy and incomplete.

From this point on to the ultimate sale to the consumer, definite knowledge of the desirable qualities and functional purposes of plastic materials tapers to almost nothing. By way of illustration, this writer at the recent Giftwares Show examined a line of exquisite merchandise well styled in chromium and molded phenolics. When asked what the handles were made of, the salesman replied: "Some new composition stuff that doesn't burn." I asked him if its finish was permanent and wouldn't chip, and he said he thought so but wasn't really sure about that. "Anyhow," he added rather helplessly, "all our things are guaranteed!"

Would it be wrong at this point to ask: "Why shouldn't the merchandise bear a neat tag or label

which tells *why* plastics are used for handles—and tell it all to everyone interested?" Surely the salesman should know. He would avoid the embarrassment caused by such questions as mine. Why hasn't he been informed by the manufacturer on this important point?

Why hasn't the maker of plastics followed his material through to the consumer to definitely establish in the minds of all who handle the product that phenolics, or whatever, are ideally suited to this particular use, and why!

These final remarks are naturally not to be attributed to Mr. Lescaze's prompting, but they are brought to mind by his succinct definition of modern design—"solving the definite American problem of today with materials of today!"

OUTGUESSING THE COLOR TRENDS IN PLASTICS

(*Continued from page 47*) at first glance, to be the last element that would affect plastics participants. But there is every prospect of interrelationship, now that plastics containers are making headway as food receptacles. More especially since plastics are stealing the show in the matter of ornamental and utilitarian closures for food packages. Natural colors in foods may be regarded as static but where the plastics outfitters may come in is incident to the extensive and increasing use of artificial colors for food preparations.

It is possible for plastics leaders to study fashions in food colors, thanks to the circumstance that Uncle Sam maintains a Federal system of certification for the dyes on a list of approved food colors. In practice this list is subject to constant change. Colors are dropped from the roster when demand falls off and new colors are added from time to time. Moreover, the Government can supply detailed information showing, comparatively, the annual consumption of each color and thereby throw light on the color trends. The man to write to for the inside facts on food colors is Mr. H. T. Herrick, Principal Chemist in Charge of the Color Certification Laboratory of the Food and Drug Administration, U. S. Department of Agriculture.

Industrial design registration bureaus, which have multiplied apace since the NRA gave business a new concept of cooperation and self-government, are, for plastics color-conformists, an important source of forward-looking information. Some of these registration offices are private, commercial ventures. In more instances they represent intra-industrial or inter-industrial institutes or subsidiaries of newly-founded Code Authorities.

No forthright statistics on color preferences await the plastics caller at a design registration agency. In most instances the design enrolment bureaus are not concerned with color, as such. That is to say with naked color. But in color-ridden lines the designs registered are executed in color. And since they, instinctively, take the color pulse of the designs passing through their hands, the registrars have a pretty ac-

curate idea of the colors on which trade attention is focused. Registration bureaus, which may take sidewise glances at color evolution, are now serving lines ranging through textiles, toys, leather goods, furniture, curtains, handbags, upholstery, jewelry, etc.

For all members of the plastics industries whose turnover is dependent upon womens' votes, the most reliable, and therefore the most valuable tips on color trends are the hunches of the color coordinating agencies. We have to face, at the outset, a seeming limitation in the scope of this color forecasting. Color guidance by the cooperative agencies, to which we have just referred, is concerned with the basic ensemble colors that are to prevail in womens' garments, costumes and accessories.

To illustrate where plastics come in on this preparedness for fabric-colors-to-come we have only to take the case of plastics buttons, buckles, ornaments, etc., which are bound to dance to the color tune of the costumes on which they are used. But this is by no means the full extent of the color reflection. The colors of a seasonal line of plastics, umbrella handles, handbag tops, card cases, purses, vanities, costume jewelry, cigarette holders and cases, and other accessories and appointments are arbitrarily dictated by the "volume colors" that are in vogue for the period. Nor, can the picker of colors afford to ignore the fact that in all the leading department stores and specialty shops the sales people, buyers, stylists, and members of the merchandising staffs will be found energetically "recommending" to customers the colors which figure in the authoritative selections for that season.

Plastics marketers may gain access to the color forecasts as soon as do members of the group for which they were prepared. The Merchandising Division of the National Retail Dry Goods Association, 225 West 34th Street, New York will supply its color cards to nonmembers at modest fees. The colors—represented on the cards by swatches—are selected by a Color Coordination Committee made up of representatives of buyers' associations, executives of fashion services, delegates from specialty stores, etc. An effort is made to project appraisals of color trends as far in advance as possible.

The Textile Color Card Association of the United States, 200 Madison Avenue, New York, is another source of color information susceptible of translation into the production plans of plastics interests. All of the fortune tellers fortify themselves for color prophecy by careful study of the Paris style showings. Playing into the hands of the plastics clan is the fact that the color pilots are striving, as a matter of permanent policy, to advance their forecasts as far as possible, so that preliminary, if not conclusive color findings, will be in the hands of store buyers before they start on their buying trips.

How shall the plastics christener obtain a preview of budding color *names* that are yet below the horizon? Particularly the fanciful names invented or coined to

distinguish novelty colors that are to figure largely in seasonal promotions? For all that this country is daily growing more color-conscious, we yet lack any standard system of color nomenclature—public or private. When it comes to designating new or modified colors it is a case of rugged individualism run riot.

A second hurdle, is that creators of color names, in almost all lines, are prone to keep their secrets until the color-decked goods go on the market. Color names cannot be copyrighted, as such. Nor may a color name, if descriptive, be registered as a trade mark. So the color-cappers seek safety in silence. But this need not balk the plastics tradesman who will go to the trouble to win the confidence of the originators of color names. On a showing of interest as producers of supply-lines or feeder-lines, plastics outfitters may usually obtain advance proofs of the color-names as well as the actual colors that are slated for the seasonal range of a specific line of, say, motor cars, or toilet articles.

Sometimes, help will come from the most unexpected quarters, to the plastics pioneer who has his ear to the ground. For example, the annual catalogs of seedsmen and nursery-men sprout inspiration. If the plastics policy man, scanning the 1935 flower catalogs, notes that honors are going to "Blaze" and "Golden Gleam," and "Orange Flare" and "Glowing Sunset" he is safe in guessing that these headliners will have a certain amount of general publicity during the ensuing season. Even the big general catalogs of the large mail order houses are not to be scorned. The Montgomery Ward and Sears Roebuck "Color Dictionaries" of style colors are handy helpers for the plastics specifiers who have to change their language of color with the seasons, or the quarters of the calendar.

SPEAKING OF SYNTHETIC

(*Continued from page 40*) ducing what seems in retrospect to be a never ending stream of synthetic, fundamental materials.

We have only to look around us to see how very successful man has been in making materials with which nature did not provide him. Steel, an alloy of iron with carbon or other elements; glass, made by firing sand with soda and potash; concrete, a composition of gravel and cement; brass, an alloy of copper and zinc; brick, porcelain, and tile. Each of these are fundamental materials and used as such.

Synthetic resin plastics, however, are apt to be spoken of with the nose slightly tilted aloft. The newest of the fundamental materials are still suffering from growing pains, and a lack of firm parental control, which would have prevented them from wandering far afield. They have been used for ill-advised applications in almost every industry at one time or another in the past twenty-five years, and the true rumors of tragic failures resulting from misapplications have somewhat impeded a natural growth and put them in

ill-repute. Intelligent and leisurely thought would have prevented most of the catastrophies resulting from the attempt to use molded plastics to replace wood, iron and glass, but once the human being is presented with a new material he will try to use it in every phase of industry.

There are several types of plastic compounds, but here it is necessary to consider only two, the thermosetting phenolics and ureas, which in the group of permanently rigid molded plastics, are of most industrial importance. Have they assumed their proper place as fundamental materials, or are they employed only to imitate either the natural or earlier developed synthetic materials? Or stated in another way, has an intelligent imaginative use been made of the inherent qualities of these plastics?

Sharing some of the characteristics of all of the tried and true materials, the molded plastics offer in addition certain distinct physical properties peculiar to them alone. These are so well known that it scarcely seems necessary to list them here: moldings are light yet extremely tough and durable; they possess excellent dielectric and insulating properties; they are solvent-, acid-, alkali-, grease- and to some extent water-resistant; they are produced by one single, simple operation, even when inserts and threads are included in the piece; they possess surfaces integral with the piece which do not chip, peel, corrode or lose their original sheen; they are extremely beautiful and pleasing to the eye, whether opaque black, translucent colorless or pastel in shade.

There are a thousand and one legitimate uses for such a material. But to answer the questions asked above, let us look at the uses to which they have been put. Perhaps the one industry which has used moldings most honestly is the automotive industry, which today is the largest consumer of the phenolics, and a large user of the ureas. Molded plastics are almost indispensable to the ignition system of the automobile, and intelligent advantage has been taken of inherent characteristics in molding gaskets, door bumper blocks, dome lights, coil caps and cases, translucent panels designed to serve as dials for speedometers and other instruments, and control knobs. Having grown up side by side with plastics, it is only natural that the automotive industry should have explored their possibilities more fully than has any other industry.

The electrical industry has, however, been quick to grasp the advantages of the molded plastics, which due to insulating and dielectric qualities particularly, have proved to be the ideal material for wall plates, gang outlets, lock switches, pilot light receptacles and other intricate parts. The translucency of the ureas has been intelligently put to use in the production of living room, outdoor, refrigerator and stove lamp shades, in large quantities. The urea shades transmit a softer, more diffused light than opal glass, yet are lighter and considerably more shatterproof.

Advantage has been taken of the excellent properties of plastics in the manufacture of radios, for molded parts such as tube bases, into which went a large part of the early production of phenolic compounds due to excellence of the power factor, and the beautiful urea cabinets met with the instant approval of the manufacturer and the consuming public. This cannot, however, be fairly said of the cabinets which have been molded to simulate precious woods, marble or onyx, and which have been accepted for what they are, imitations.

One would search the world over to find finer buttons than those which are molded. They are resistant in an astonishing degree to the rigors of the weekly washing, yet best of all do not fade or become off-color because the entire button and not merely the surface is colored. In addition, a uniformity of color is maintained which is impossible to equal with the dyeing process used on ivory nut or other "natural" buttons.

Larger and larger molded housings make their appearance, yet the outside limits of size have not as yet been approached. Here is a field which will fall like the walls of Jericho when the plastics make a truly determined advance. In the packaging field, containers have been molded for such diverse items as suspenders and the Encyclopedia Britannica, with tremendous sales increases resulting. Each year brings forth a more varied line of molded packages, yet so versatile is the material, and so easily adapted to fine design, that infinite variety is possible. The beautiful combination packages of plastics, and metal, for example, have only begun to be produced.

So far we have looked only on the bright side of the picture, and that is all that is here necessary. A list of dishonest and unintelligent applications of molded plastics would serve no purpose here, and would only augment the ever growing list of industrial products which have obviously never been allowed the privilege of even a perfunctory introduction to functional design. The reader can, without difficulty, however, pick out moldings in industrial and commercial use which deserve to be placed in a museum of dishonor whose wooden walls would be painted to represent marble and which would be tastily decorated with metal flowers.

The intelligent manufacturer stops to consider which material is best for the application which he has in mind, and does not rush blindly ahead with the element of cost uppermost in his mind. He uses molded plastics when their inherent qualities render them most suitable and queries himself in this manner, when considering the use of these or any synthetic materials: "Am I choosing this material because for this use it is generally superior to all other available materials, and because it allows for economy of production, or, am I adopting it with the sole thought of imitating a better and more expensive material?" To be sure, the millenium will be here when this rule is universally applied, but the thought of it is most refreshing.

CAN PLASTICS REPLACE GLASS?

(*Continued from page 25*) to cementing . . . the bonding points becoming as strong if not stronger than the other sections of the bottle.

In use, the hinged metal fitting permits of ready inversion of the bottle for filling. Here, when a careless oiler might permit the bottle to strike a metal surface, acetate eliminates the hazard of breakage completely. When filled, the bottle automatically holds a constant oil level in the fitting and thus in the bearing into which the oiler feeds.

While this application is a limited one, it points the way toward others in the gradual replacement of glass for certain purposes. The important point is not that glass has been replaced but rather that cellulose acetate has filled the bill because of its pecular plastic qualities.

Credit: To Tennessee Eastman Corp. for Tenite, the material used and for development of the fabricating and cementing operations.

A STRAW IN THE WIND

(*Continued from page 24*) cause these products have been well designed.

In fact, it is competition of this very nature that has been responsible for the re-designing of several well-known and established products. A cheap, fly-by-night article, placed on the market for quick, clean-up sales has forced a genuine, well-established article to adopt a new design or a new package to maintain its leadership. It is a sad commentary on the foresight of manufacturers that unworthy competition in many cases has had to point the way, but there is another side to this inverted trail-blazing which is even more to be deplored. The widespread adoption of modern design by manufacturers of inferior products has caused many conservative manufacturers of worthy products to look upon industrial designs as a current craze—an illegitimate child born of highly competitive market conditions. This reliance on reputation and former public acceptance of their products and the total dismissal of design as a sales factor, has caused a number of well-known products to lose their former profitable leadership. In some cases, where conservatism dominated the entire management, and not even packages, letterheads, or advertising was permitted to reflect the modern trends, the product completely disappeared and its place was taken by some other product not so hidebound by fear or tradition.

Although it is true that some charges of indiscretion justifiably may be directed at the modern industrial designs which were evident several years ago, it is only fair to admit that the designs prevailing currently exhibit fewer and fewer objectionable features. Modern design has passed through its adolescence and has settled down to the happy business of making products more salable. Few manufacturers today are shutting their doors to this sales-creating force. Motor car

manufacturers and mousetrap makers alike have seen in the growth of modern industrial design a new issue—and realize that the side they take may determine whether or not they remain in business.

This gradual awakening to the importance of design on the part of consumers and manufacturers, is reflected in the demands made upon the industrial designer. No longer is he a mere artist. As the man who dictates in what outward form the product shall meet the buyer, the industrial designer must know marketing, merchandising and sales psychology. He must be familiar with the mechanical production details, with the limitations of the machine. He must, of course, be able to apply the principles of design in artistic good taste. His ability to integrate the units of any one article into a unified whole overshadows these other qualifications, but without them he remains primarily an artist rather than an industrial designer.

At the present time there is one quality demanded of the modern industrial designer which springs from a factor whose importance, until recently, has not been properly understood. This factor is the introduction of a number of new materials, particularly the plastics. This whole range of compounds has provided the industrial designer with materials that lend themselves to many uses, offer innumerable advantages and neatly fit the requirements of the modern industrial planning. It is no wonder that their use is becoming more and more widespread. Plastics are easily molded, have strength and durability and lightness, may be obtained in almost any color, combine easily with wood or metal, present an attractive appearance and are comparatively low in cost. The development and introduction of the various plastics has probably contributed as much or more than any other single factor to the greater beauty and increased practicability of the many newly designed products on the market today. Plastics made possible, for example, the beauty, lightness and simplicity of the Airguide combination thermometer and humidity indicator illustrated herewith. It is tremendously important, therefore, that the alert industrial designer be thoroughly familiar with the durability, pliability, "work-ability" and adaptability of so advantageous a material.

By emphasizing the plastics, no reflection is being cast on such older materials as wood, steel, chromium, aluminum and glass. The good industrial designer must know the limitations and advantages of all these materials intimately, but it is especially important for him to keep pace with new materials that enlarge his scope.

Industrial designers have been accused of an artistic disregard of the limitations of materials. Any one familiar with the way a designer works knows that such an accusation is unjust, except perhaps in those cases where the designer himself is a fraud. In any branch of art, the artist must have been thoroughly schooled in the use of his media—and if he is an industrial designer of any worth, it is safe to say that he *knows* the materials with which he works. He cannot achieve success otherwise.

CLASSIFIED

CHEMIST desires research connection to improve on present products. Cold molding field preferred. Reply Box 108, Modern Plastics.

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Supervisor of Plastic Molding with knowledge of all branches, from estimating cost to finished product, desires position; 30 years' experience with same concern. Available on short notice. Reply Box 110, Modern Plastics.

•

WANTED—USED LABORATORY EQUIPMENT—small hand pump, press with electrically heated platens, small roll, small jacketing kettle, small dry-mixing machine. Give full information. Reply Box 111.

•

POSITION WANTED—10 years' experience in mechanical drafting and designing; 15 years' experience in molding plants as General Foreman, Superintendent, Tool room foreman and estimator on mold costs. Is available for immediate position with progressive concern on suitable terms. Reply Box 112.

•

EXECUTIVE POSITION WANTED—M.E. with a background of twelve years' executive experience in the plastic field. Thorough knowledge of hot and cold process, mold construction and design, production and plant management. Reply Box 113.

With so much demanded of the industrial designer, is it any wonder that so few names stand out boldly as leaders in the field? Name any one of a dozen human fields of endeavor and at least a half-dozen names will come to mind. Industrial design has its giants too, but they are fewer in number. A reputation as an outstanding industrial designer does not come to a man until he has earned it—until by sheer merit of his efforts he hews out a niche for himself.

Now that industrial design has outgrown its adolescence, now that it has proved itself to be no mere fad, more and more manufacturers are taking cognizance of this stranger in their midst. Having seen what has happened to the sales of their competitors when modern industrial design stepped in to add beauty to products and packages, they, too, are beginning to see that industrial design can be a most valuable means to an end. The alert manufacturer no longer derides this new contribution as an ephemeral artistic influence having little, if any, bearing on his welfare. He has seen convincing demonstrations in the public's acceptance of an industrially designed product and is beginning to admit its importance. The more progressive manufacturers have, of course, passed through this stage and are busy seeking industrial designers capable of solving their particular problems. Their question is no longer "Shall I?" but "Who?"

CHANGING FASHION DEMANDS VERSATILE MATERIAL

(*Continued from page 19*) at such a low price. The real volume of his business is done with items which retail at fifty cents and one dollar.

"We keep our quality up and our prices down by the simple expedient of selling exclusively to the jobbing trade. By doing so we eliminate the necessity of packing and shipping innumerable small orders which are costly to make in small quantities. A simple method but a mighty important one in quantity production merchandise. The sizable orders placed with us by jobbers allow economical planning and purchase of material, and permit us to operate with efficiency on continuous business giving steady employment to more than one hundred skilled operators who are well trained to the quality demands of our product."

While talking with Mr. Seidman, one of his designers presented a pencil sketch of a new item for his approval. Within the space of minutes, while we were still talking, the designer returned with the finished piece, a most attractive dress ornament in classic design with all the appearance of rose quartz, yet it will retail at the surprisingly low price of fifty cents. The coordination of this versatile material with the flexible method of fabricating it has created a genesis of sport jewelry which fashion will find difficult to put aside.

Did you ever see cast phenolics fabricated? It is a fascinating business.

Of course, machinery is employed but fabricating cast phenolics is, more or less, essentially hand work. As a

matter of fact, much of the decorating and ornamenting is free-hand work. The phenolic material comes to the plant in the form of tubes, bars and sheets of varying sizes, shapes and colors of varying lengths. It is sawed, ground and drilled into intricate shapes, then polished in big rolling tumblers to the smoothness of glass. Buttons, for example, are first sawed into discs from a bar of solid phenolics the approximate diameter of the finished button. These discs are shaped on a semi-automatic lathe which gives them their bevel. But there is handwork nevertheless. Each disc is placed in the lathe by hand and the lever which controls the knife is operated by hand but is so set as to give each button identical form and outline. Then if the buttons are to be ornamented with a cut design, they are placed by hand against a rapidly moving cutting blade of stone which gives them their design one little line or dot at a time. They are then drilled and polished and fastened on cards for the retail trade. Considering the hand work, one is amazed at the low price at which such buttons may be obtained.

Bracelets are sawed from tubes of cast phenolics of appropriate diameter, and are likewise ornamented by clever workmen who hold them against grinding wheels at exactly the right angle with exactly the right pressure and for exactly the right length of time to give them form and design. With nothing to guide them but their perfectly coordinated sense of sight and touch, these men are experts at the work. Their hands are never still. The bracelet is in constant motion from the instant they pick it up until they lay it in the box before them ready to be polished. A deft twist as it is pressed against the wheel gives it shape and design at the same moment. A rapid turn of the bracelet and the shape and design is repeated with uncanny similarity in another space. Rope designs, leaves, delicate petals of flowers in full bloom or conventional patterns are all made in the same way with surprising speed and facility. Rings are made in much the same manner.

Directly behind each grinding wheel is a small powerful suction tube with funnel shaped opening which picks up all waste material as it is ground by the wheel and removes it from the building leaving hardly a speck of dust on the workman's bench and absolutely none in the air of the room.

Pins, clips, buckles and millinery ornaments are designed first on paper. Then tracings of these patterns are fastened to a flat sheet of cast phenolic and sawed out with jig-saws to give them their outline. From this point on, they are fashioned much the same as bracelets. Their designs are cut into the surface with grinding wheels and their edges are smoothed by the same operation. After holes have been drilled in the proper places for their insertion, pins and other metal attachments are put on by hands equally skilled in the work, in the finishing department.

All pieces are then consigned to the tumblers, which are big revolving wooden drums in which the pieces are tumbled slowly about in sawdust until they are perfectly smooth.

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